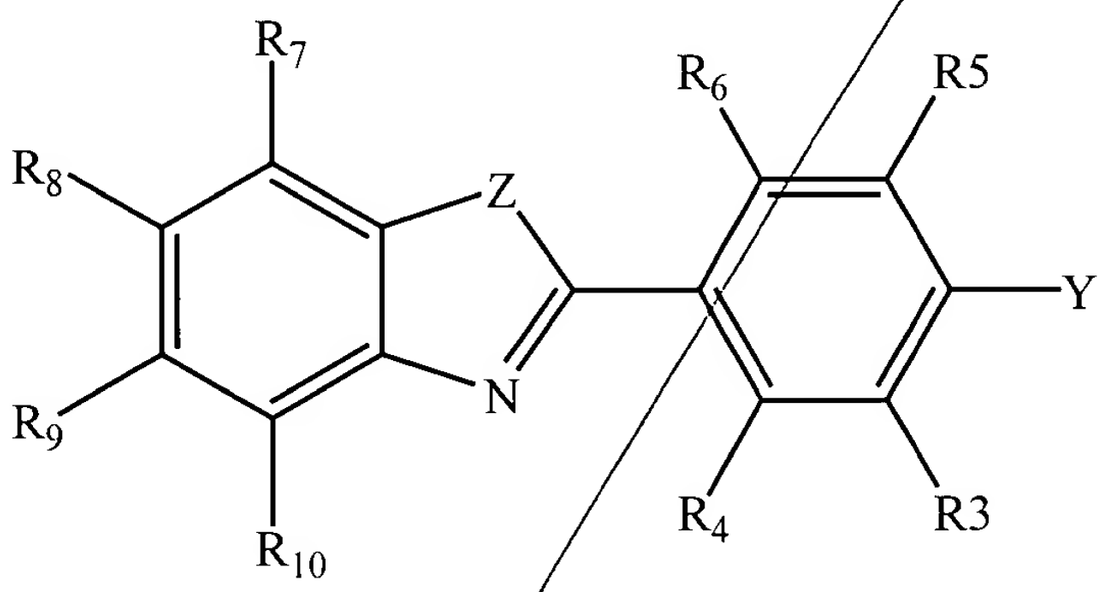
Applicants reserve the right to file a divisional application covering the subject matter of the non-elected and/or cancelled claims. Further, they note that Examiner is obliged to consider a reasonable number of species, once the claims are deemed allowable as to the elected species MPEP §806.04(a).

AMENDMENTS

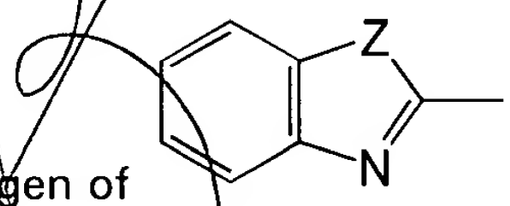
Please cancel claims 1-43, without prejudice or disclaimer, and add the following claims:

44. (New) An amyloid binding compound having the following structure or a water soluble, non-toxic salt thereof:



wherein Z is S,

wherein Y is NR^1R^2, OR^2, or SR^2;

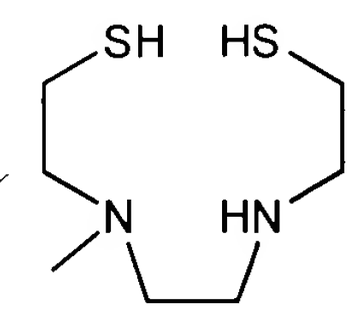


wherein the nitrogen of is not a quaternary amine;

wherein each R^1 and R^2 independently is selected from the group consisting of H, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R', R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 1, 2, 3, or 4 and R_{ph} represents an unsubstituted or substituted phenyl group with the phenyl substituents being chosen from any of the non-phenyl substituents defined below for R^3-R^{10} and R' is H or a lower alkyl group); and

wherein each R^3-R^{10} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-

CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C=O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R_{ph} represents an unsubstituted or substituted phenyl group with the phenyl substituents being chosen from any of the non-phenyl substituents defined for R^1-R^{10} and wherein R' is H or a lower alkyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of -COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is: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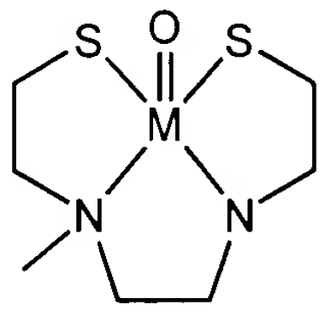
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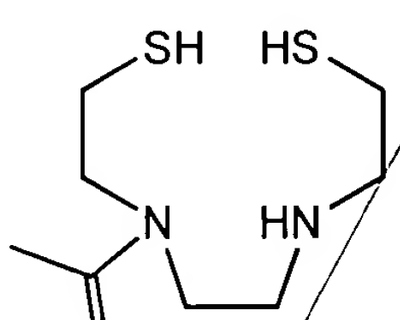
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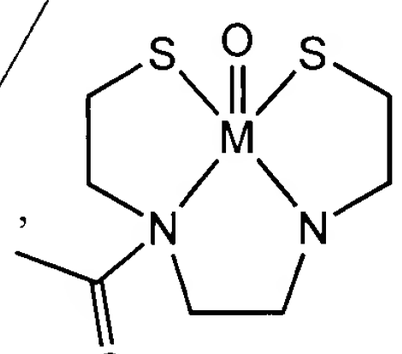
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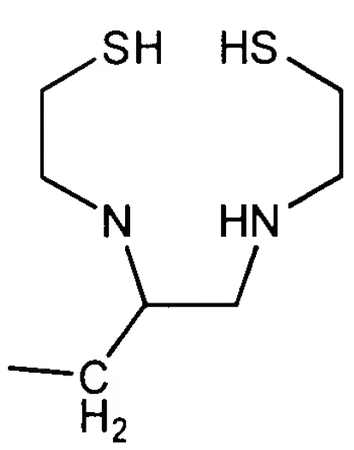
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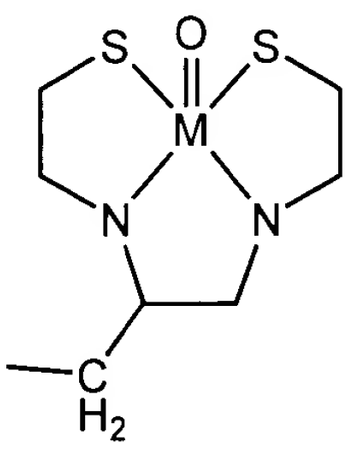
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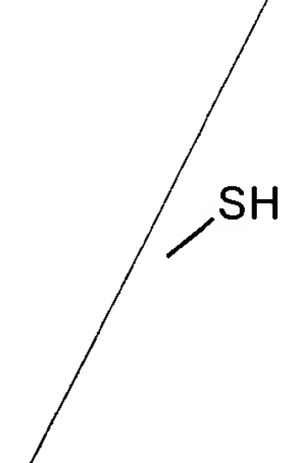
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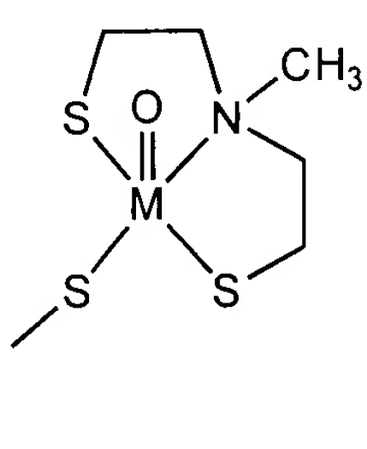
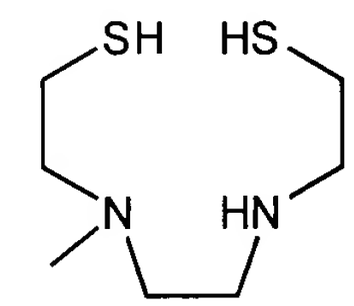


wherein M is selected from the group consisting of Tc and Re; or

wherein each R^1 and R^2 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is: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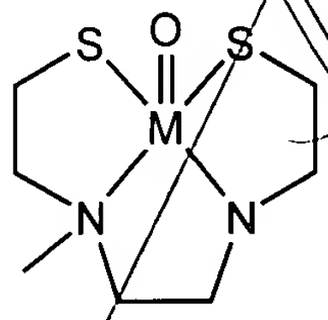
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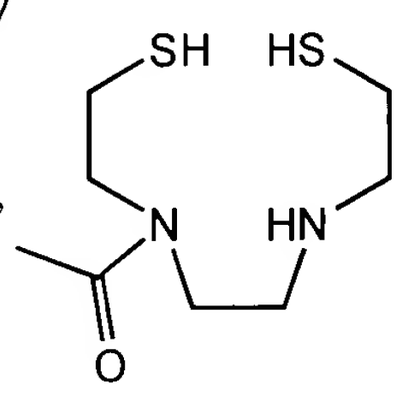
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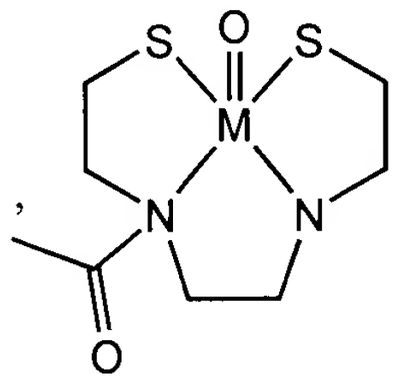
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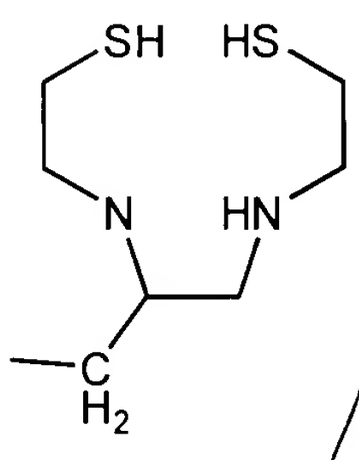
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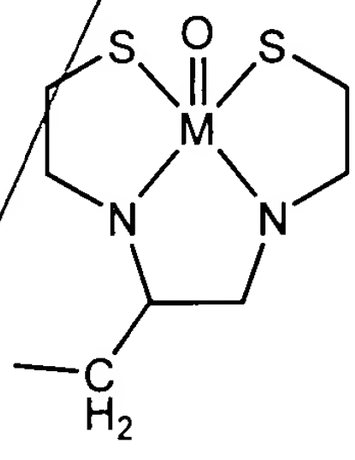
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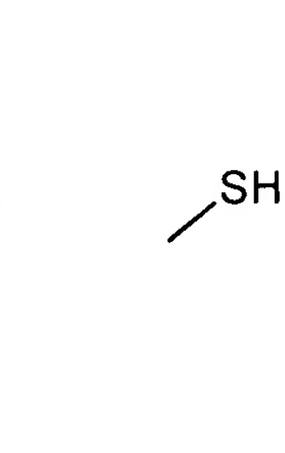
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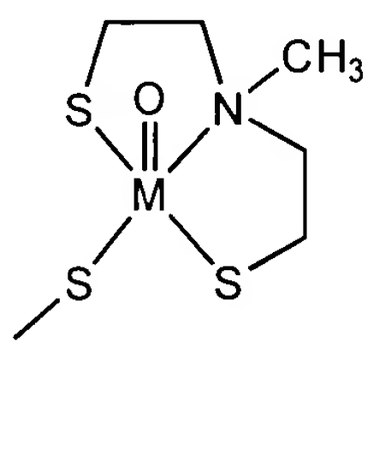
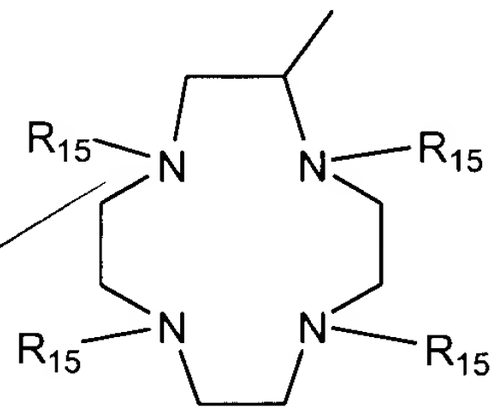


wherein M is selected from the group consisting of Tc and Re; or

wherein each R^1 –R^{10} independently is selected from the group consisting of a chelating group (with or without a chelated metal ion) of the form W-L and V-W-L, wherein V is selected from the group consisting of –COO-, and -CO-; W is $-(CH_2)_n$ where n=0,1,2,3,4, or 5; L is: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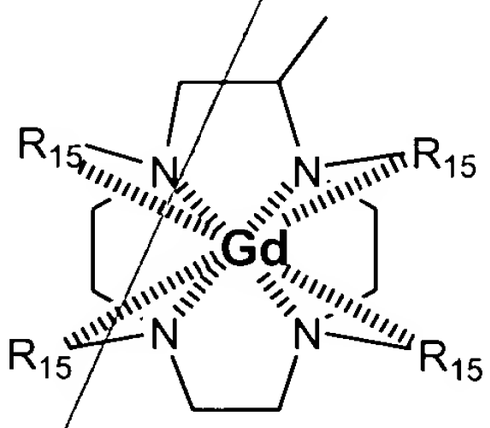
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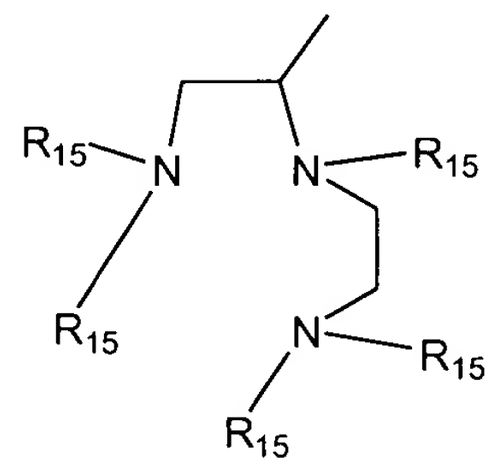
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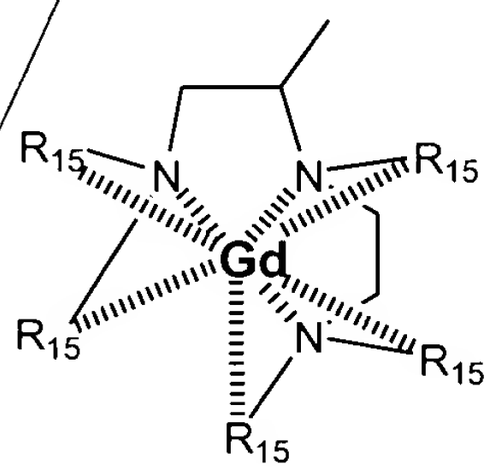
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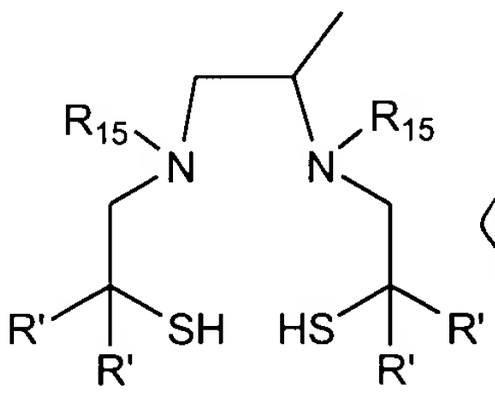
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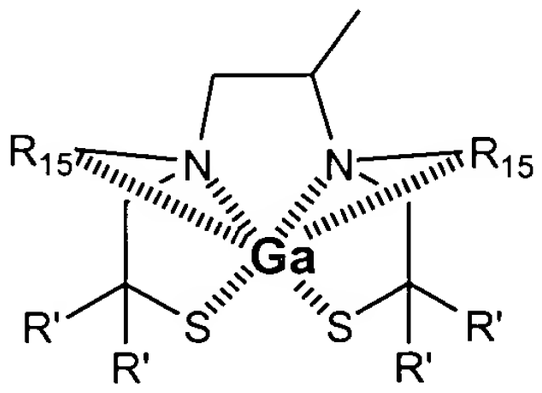
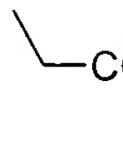
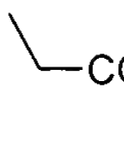
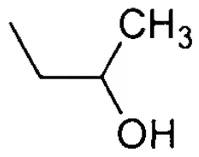
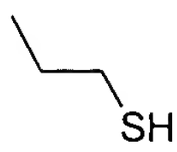
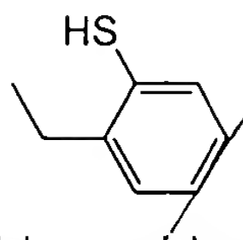
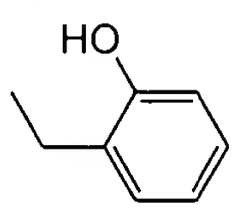
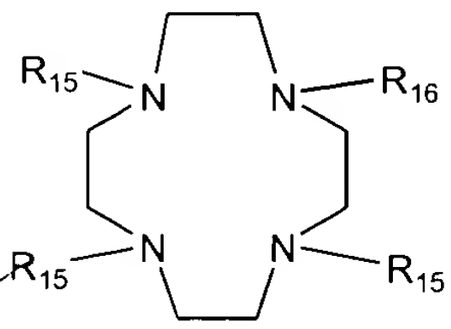
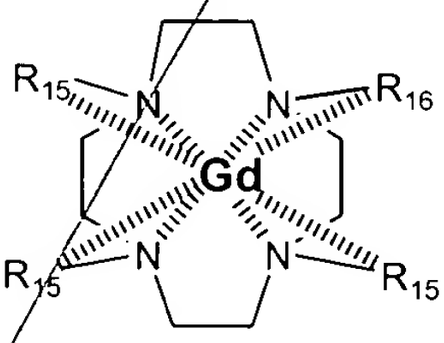
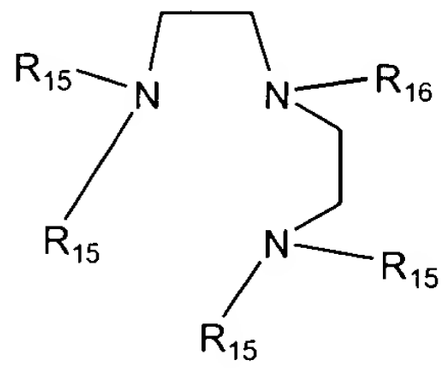
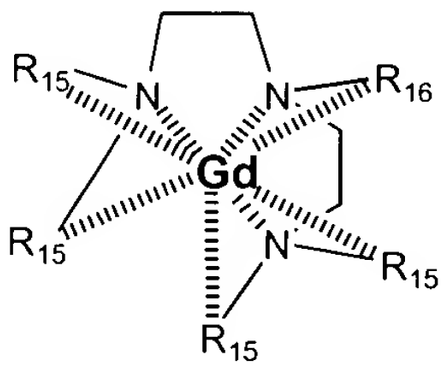
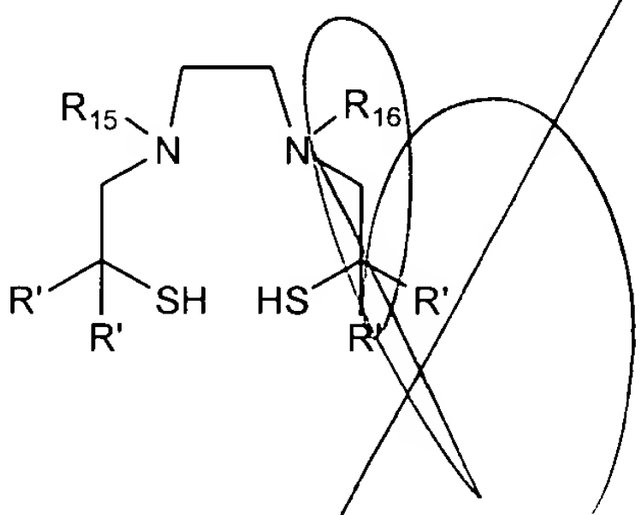
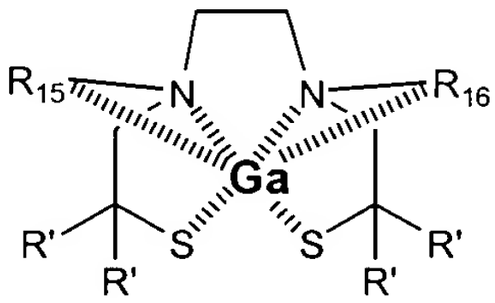
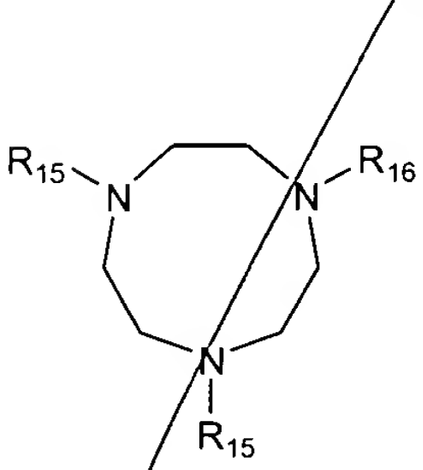
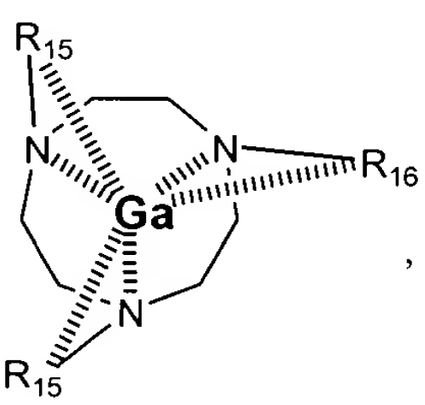
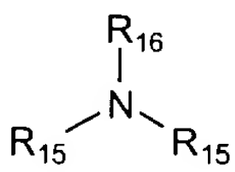
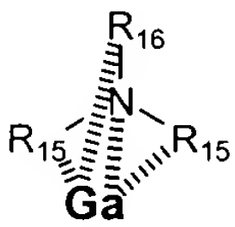

,

or

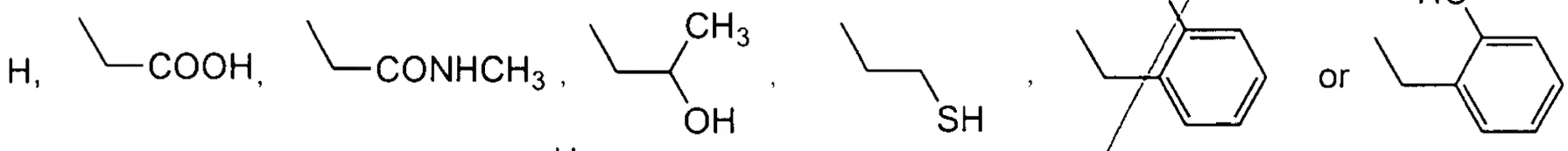
and wherein R^{15} independently is selected from the following:

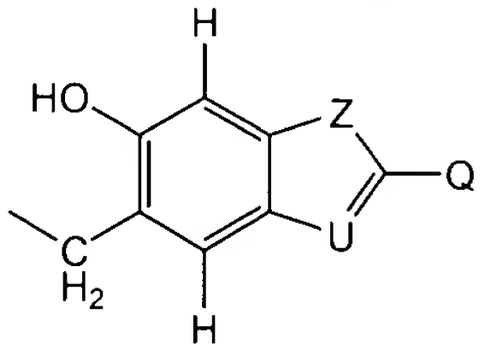
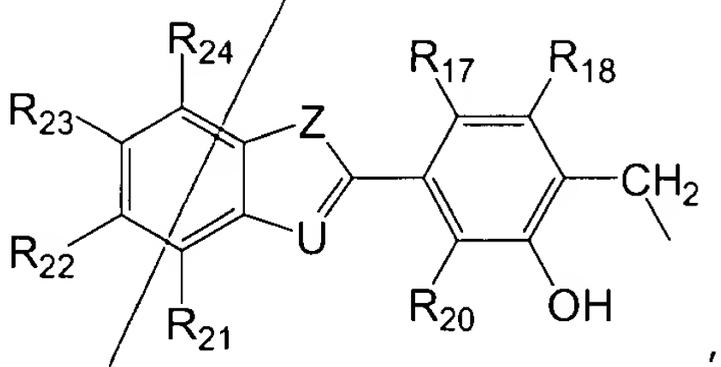
H,  ,  ,  ,  ,  or  ;

or an amyloid binding, chelating compound (with or without a chelated metal group) or a water soluble, non-toxic salt thereof of the form:

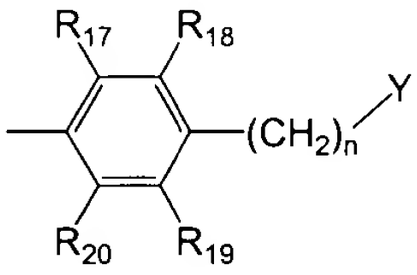
 ,  ,  ,  ,  ,  ,  ,  ,  or  ;

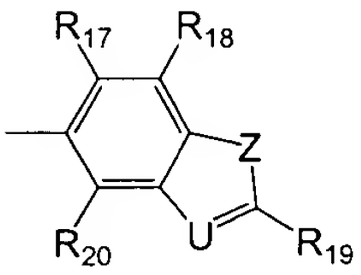
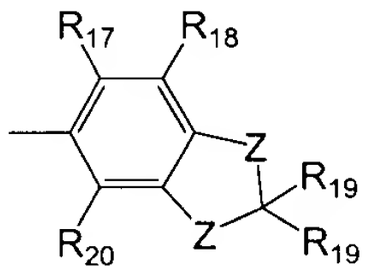
wherein R^{15} independently is selected from the following:

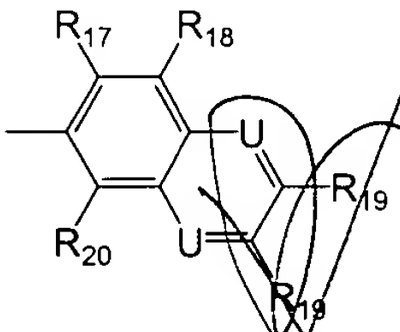
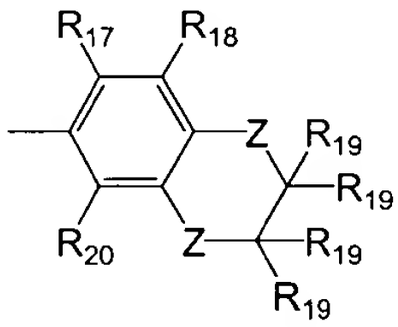


and R^{16} is  or  ,

wherein Q is independently selected from one of the following structures:

 wherein n = 0, 1, 2, 3 or 4,

 ,  ,

 or 

wherein Z is S, NR′, O, or $C(R')_2$ in which R′ is H or a lower alkyl group;

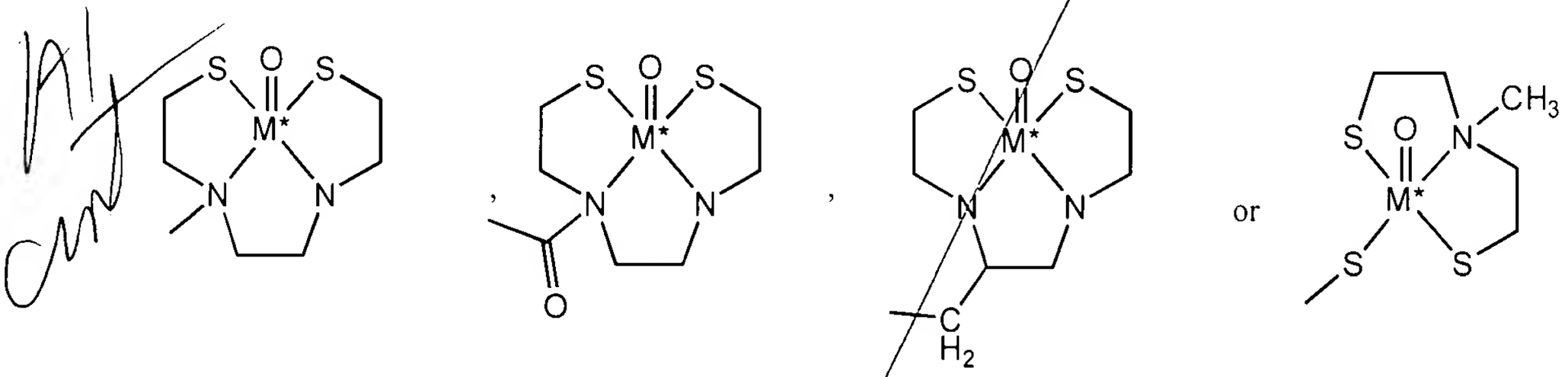
wherein U is N or CR′;

wherein Y is NR^1R^2, OR^2, or SR^2;

wherein each R^{17}-R^{24} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R′, $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R′, OR′, SR′, COOR′, R_{ph}, CR′ = CR′-R_{ph} and CR_2'-CR_2'-R_{ph} (wherein R_{ph} represents an unsubstituted or substituted phenyl group with the phenyl

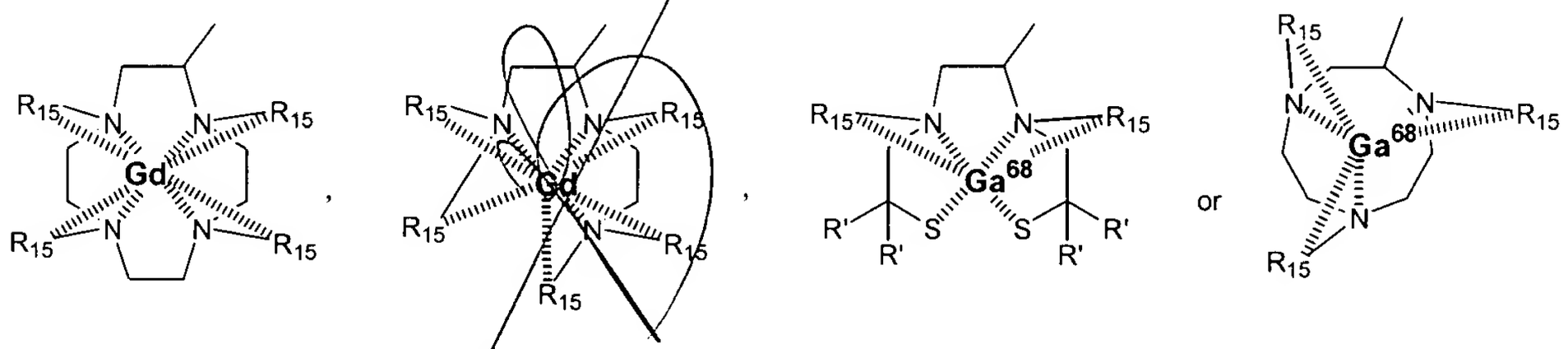
substituents being chosen from any of the non-phenyl substituents defined for R^{17}-R^{20} and wherein R' is H or a lower alkyl group).

45. (New) The compound of claim 44, wherein at least one of the substituents R^1-R^{10} is selected from the group consisting of ^{131}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, CH_2-CH_2-X*, O-CH_2-CH_2-X*, CH_2-CH_2-CH_2-X*, O- CH_2-CH_2-CH_2-X* (wherein X* = ^{131}I, ^{123}I, ^{76}Br, ^{75}Br or ^{18}F), ^{19}F, ^{125}I, a carbon-containing substituent as specified in claim 44 wherein at least one carbon is ^{11}C or ^{13}C and a chelating group (with chelated metal group) of the form W-L* or V-W-L*, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n=0,1,2,3,4, or 5; and L* is:

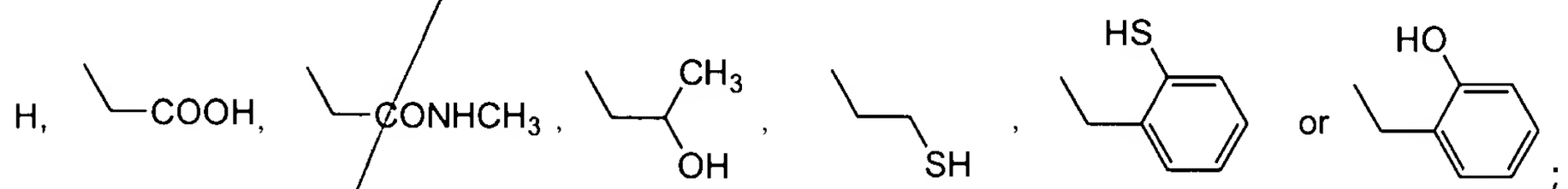


wherein M* is ^{99m}Tc;

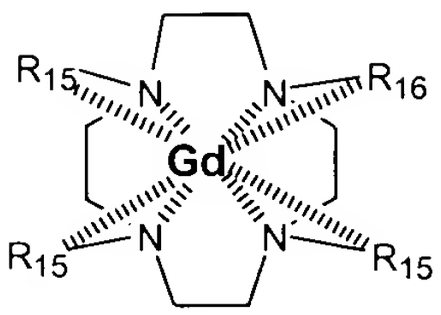
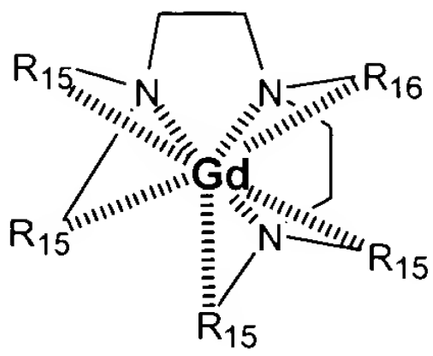
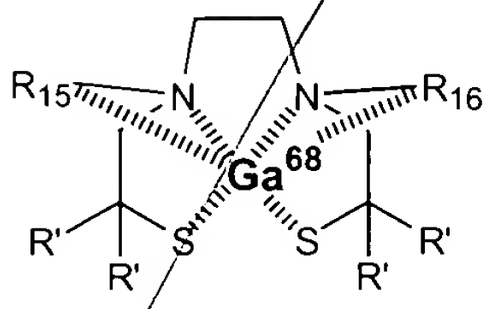
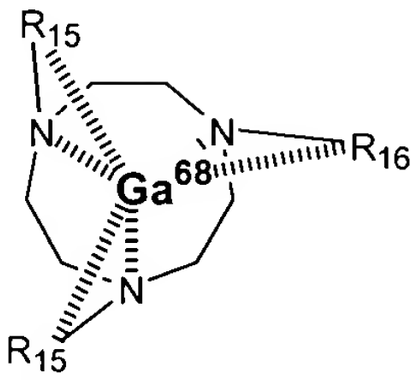
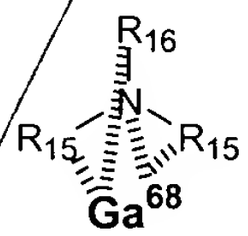
and a chelating group (with chelated metal group) of the form W-L* or V-W-L*, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n=0,1,2,3,4, or 5; and L* is:



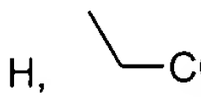
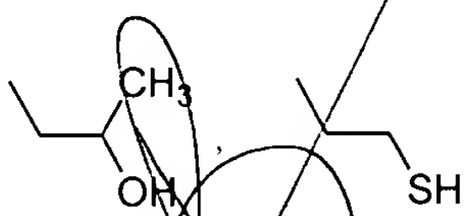
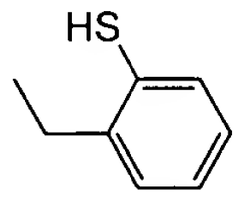
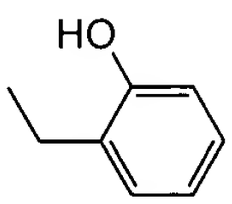
and wherein R^{15} independently is selected from the following:

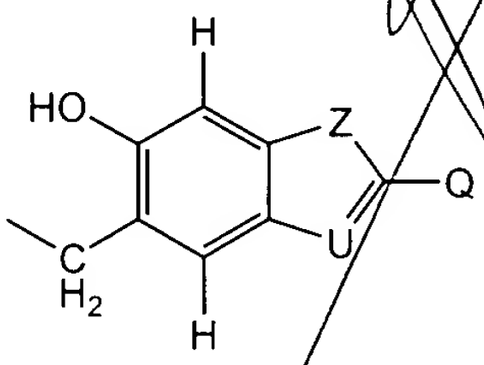
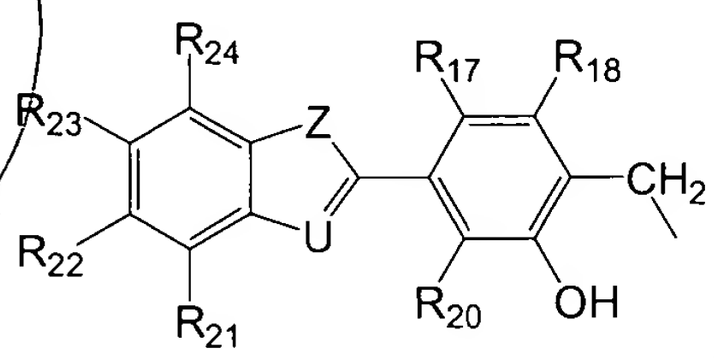


or the chelating compound of claim 44 (with chelated metal group) of the form:

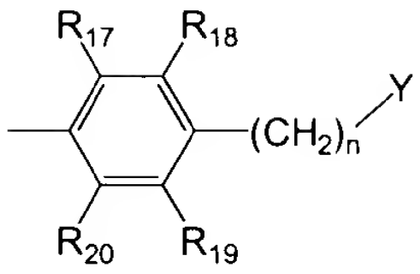




or


wherein R^{15} independently is selected from the following:

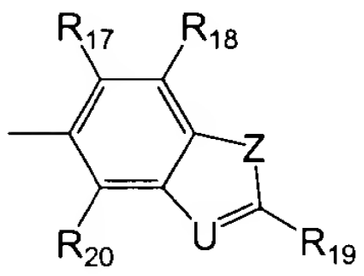
H,  ,  ,  ,  or 

and R^{16} is  or  ,

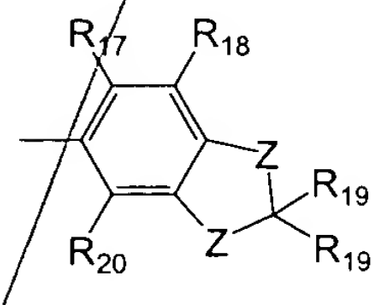
wherein Q is independently selected from one of the following structures:



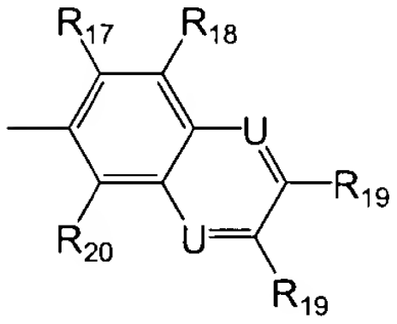
wherein n = 0, 1, 2, 3 or 4,



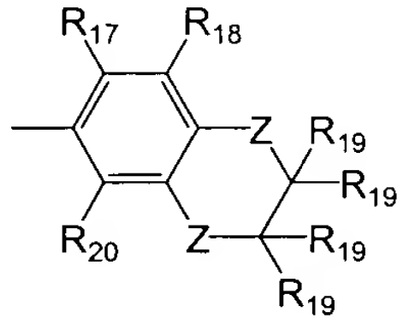
,



,



or



wherein Z is S, NR′, O, or $C(R')_2$ in which R′ is H or a lower alkyl group;

wherein U is N or CR′;

wherein Y is NR^1R^2, OR^2, or SR^2 ;

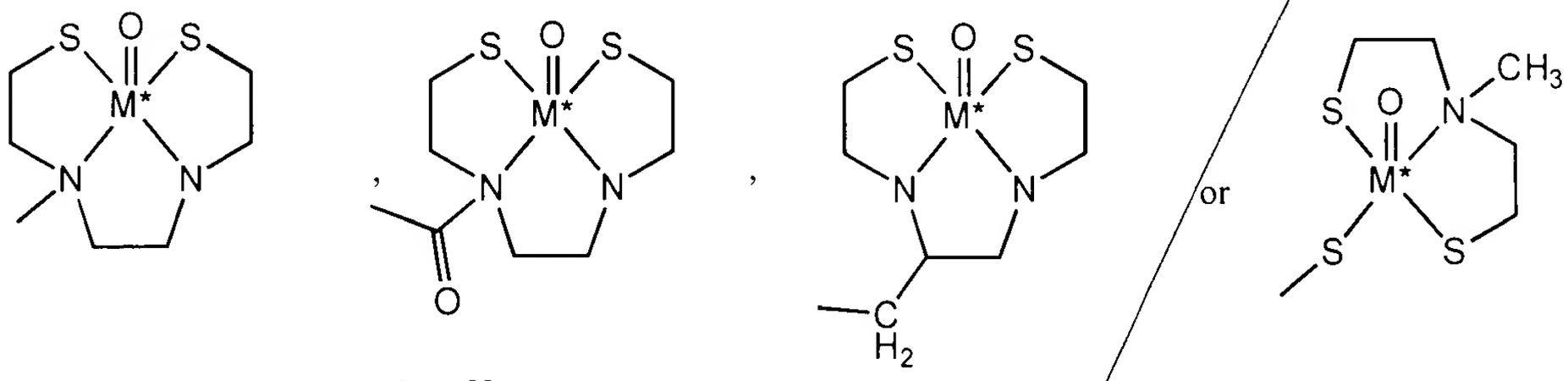
wherein each R^{17}-R^{24} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R′, $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R′, OR′, SR′, COOR′, R_{ph}, CR′ = CR′-R_{ph} and CR_2'-CR_2'-R_{ph} (wherein R_{ph} represents an unsubstituted or substituted phenyl group with the phenyl substituents being chosen from any of the non-phenyl substituents defined for R^{17}-R^{20} and wherein R′ is H or a lower alkyl group).

46. (New) The compound of claim 44, wherein, Z = S, Y = NR^1R^2, R^1 = H; and

wherein R^2 is selected from the group consisting of $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R′, R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 1, 2, 3, or 4) wherein when R^2 is CH_2R_{ph} R^8 is not CH_3.

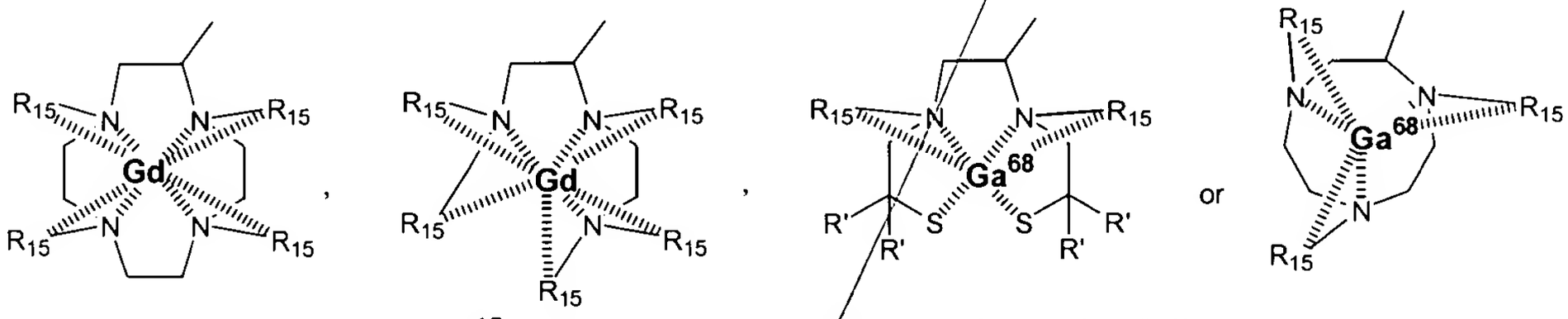
47. (New) The compound of claim 46, wherein at least one of the substituents R^3- R^{10} is selected from the group consisting of ^{131}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, CH_2-CH_2-X*, O-CH_2-CH_2-X*, CH_2-CH_2-CH_2-X*, O- CH_2-CH_2-CH_2-X* (wherein X* = ^{131}I, ^{123}I, ^{76}Br, ^{75}Br or ^{18}F), ^{19}F, ^{125}I, a carbon-containing substituent as specified in claim 44 wherein at least one carbon is ^{11}C or ^{13}C, a chelating group (with chelated metal group) of the form

W-L* or V-W-L*, wherein V is selected from the group consisting of –COO-, -CO-, $-CH_2O-$ and $-CH_2NH-$; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L* is:

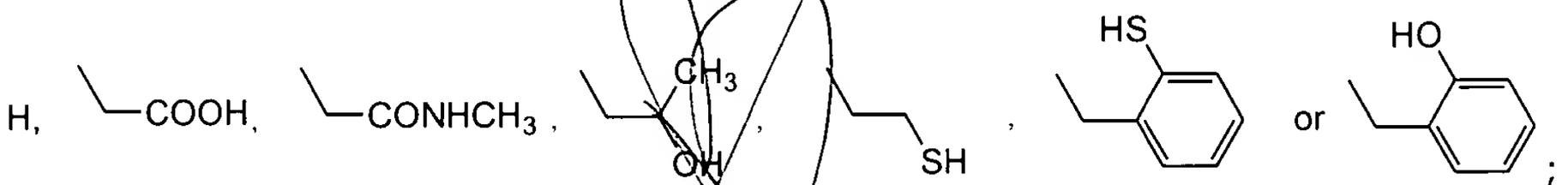


wherein M^* is ^{99m}Tc;

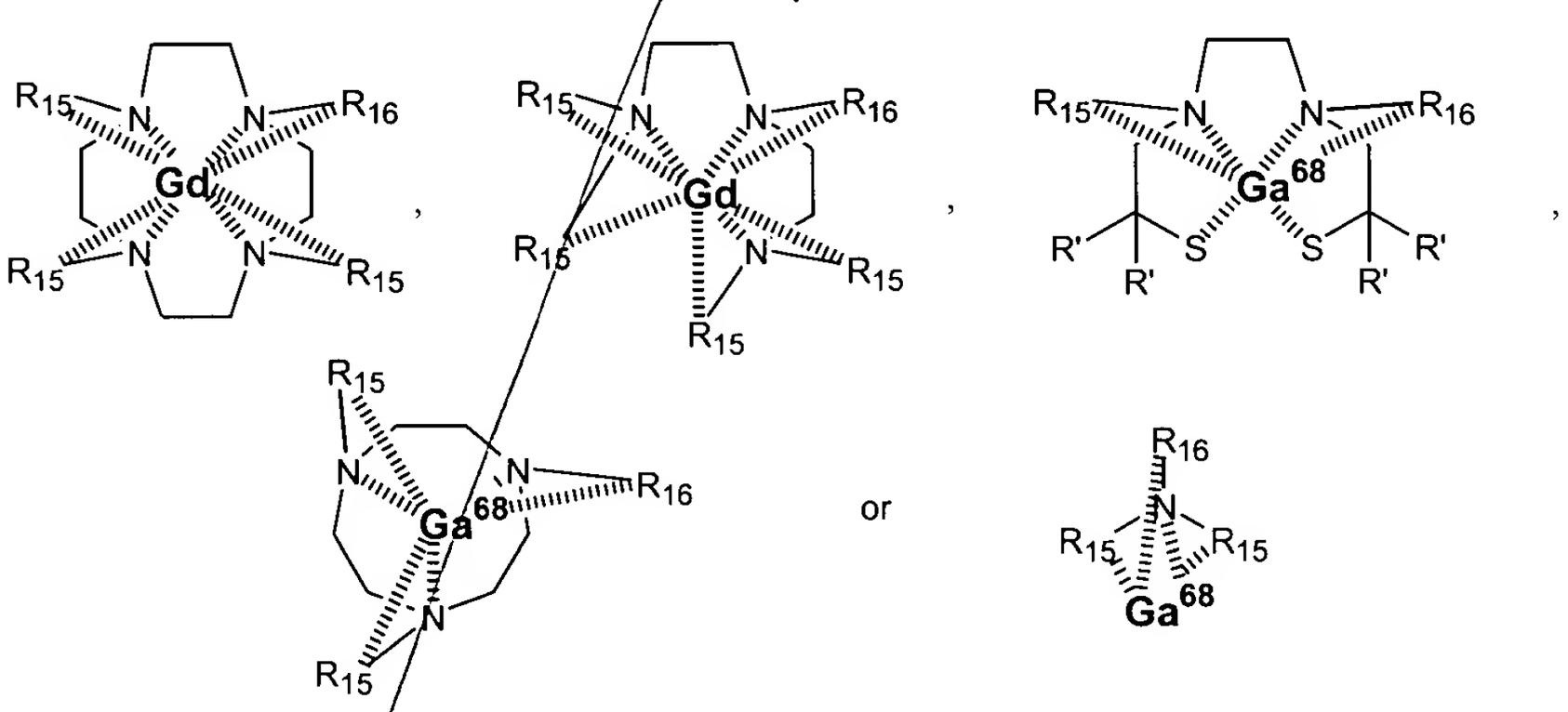
and a chelating group (with chelated metal group) of the form W-L* or V-W-L*, wherein V is selected from the group consisting of –COO-, -CO-, $-CH_2O-$ and $-CH_2NH-$; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L* is:



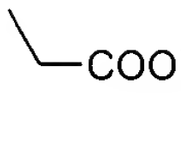
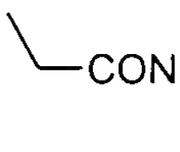
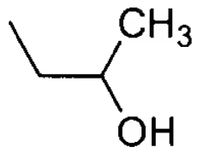
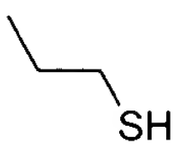
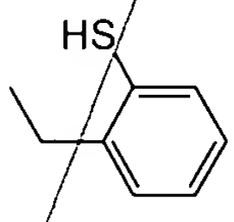
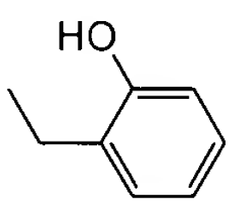
and wherein R^{15} independently is selected from the following:

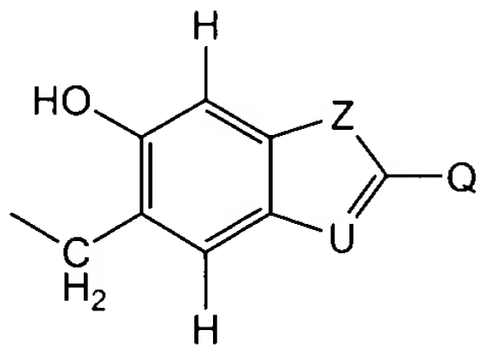
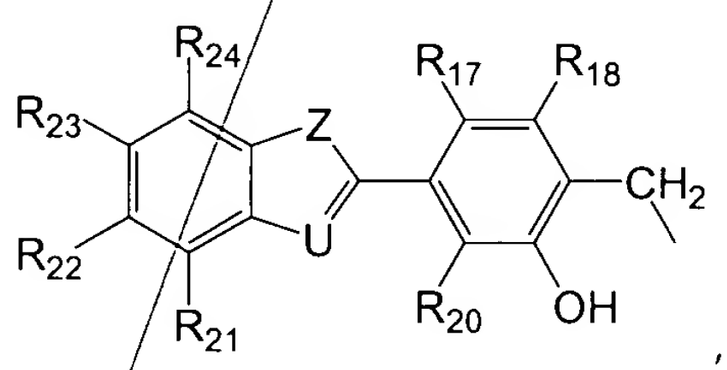


or the chelating compound of claim 44 (with chelated metal group) of the form:

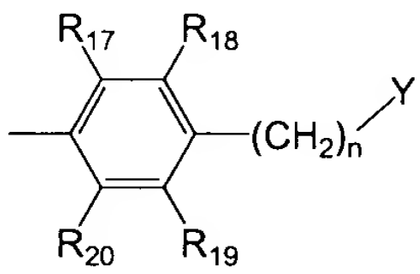


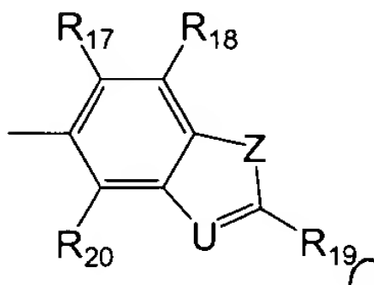
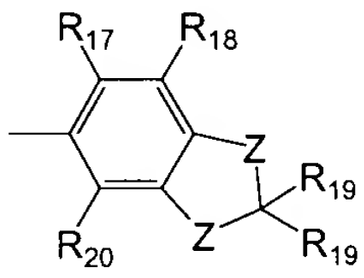
wherein R^{15} independently is selected from one of the following structures:

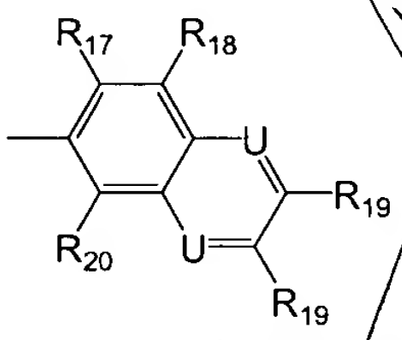
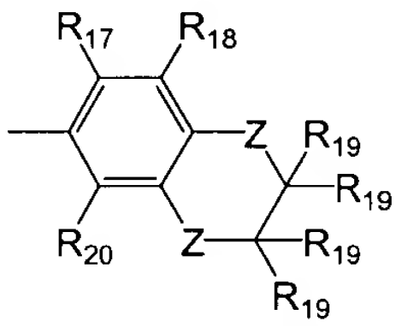
H,  ,  ,  ,  ,  , or 

and R^{16} is  or  ,

wherein Q is independently selected from one of the following structures:

 wherein n = 0, 1, 2, 3 or 4,

 ,  ,

 or  ,

wherein Z is S, NR', O, or $C(R')_2$ in which R' is H or a lower alkyl group;

wherein U is N or CR';

wherein Y is NR^1R^2, OR^2, or SR^2 ;

wherein each R^{17}-R^{24} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph} and CR_2'-CR_2'-R_{ph} (wherein R_{ph} represents an unsubstituted or substituted phenyl group with the phenyl

substituents being chosen from any of the non-phenyl substituents defined for R^{17}-R^{20} and wherein R′ is H or a lower alkyl group).

48. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, R^1 = H, R^2 = CH_3 and R^3- R^{10} are H.

49. (New) The compound of claim 44, wherein Z = S, Y = O, R′ = H, R^2 = CH_3 and R^3- R^{10} are H.

50. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, $R^{1\text{-}4}$ = H, R^5 = I, and R^6- R^{10} are H.

51. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, $R^{1\text{-}4}$ = H, R^5 = I, R^8 = OH and R^6- R^7 and R^9- R^{10} are H.

52. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, R^1 = H, R^2 = CH_2-CH_2-CH_2-F and R^3- R^{10} are H.

53. (New) The compound of claim 44, wherein Z = S, Y = O, R′ = H, R^2 = CH_2-CH_2-F and R^3- R^{10} are H.

54. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, $R^{1\text{-}7}$ = H, R^8 = O-CH_2-CH_2-F and R^9- R^{10} are H.

55. (New) The compound of claim 44, wherein Z = S, Y = NR^1R^2, R′ = H, R^1 = CH_3, $R^{2\text{-}7}$ = H, R^8 = O-CH_2-CH_2-F and R^9- R^{10} are H.

56. (New) The compound of claim 46, wherein at least one of the substituents R^3 -R^{10} is selected from the group consisting of CN, OCH_3, OH and NH_2.

57. (New) The compound of claim 44, wherein R^1 = H, R^2 = CH_3 and R^8 is selected from the group consisting of CN, CH_3, OH, OCH_3 and NH_2.

58. (New) The compound of claim 57, wherein R^3- R^7 and R^9- R^{10} are H.

59. (New) The compound of claim 44, wherein the compound binds to Aβ with a dissociation constant (K_D) between 0.0001 and 10.0μM when measured by binding to synthetic Aβ peptide or Alzheimer's Disease brain tissue.

60. (New) The compound of claim 46, wherein the compound binds to Aβ with a dissociation constant (K_D) between 0.0001 and 10.0μM when measured by binding to synthetic Aβ peptide or Alzheimer's Disease brain tissue.

61. (New) A method for synthesizing a compound of claim 44 having at least one of the substituents R^1-R^{10} selected from the group consisting of ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, and ^{19}F, comprising the step of labeling a compound of claim 44 wherein at least

one of the substituents R^1-R^{10} is a tri-alkyl tin, by reaction of the compound with a ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, or ^{19}F containing substance.

62. (New) A method for synthesizing a compound of claim 44 having at least one of the substituents R^3- R^{10} selected from the group consisting of ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, and ^{19}F, comprising the step of labeling a compound of claim 44, wherein $Z=S$, $Y=NR^1R^2$, $R^1=H$ and at least one of the substituents R^3 $-R^{10}$ is a tri-alkyl tin, by reaction of the compound with a ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, or ^{19}F containing substance.

63. (New) A pharmaceutical composition for *in vivo* imaging of amyloid deposits, comprising (a) a compound of claim 44 and (b) a pharmaceutically acceptable carrier.

64. (New) A pharmaceutical composition for *in vivo* imaging of amyloid deposits, comprising (a) a compound of claim 44, wherein $Z=S$, $Y=NR^1R^2$, $R^1=H$, and (b) a pharmaceutically acceptable carrier.

65. (New) An *in vivo* method for detecting amyloid deposits in a subject, comprising the steps of:

(a) administering a detectable quantity of the pharmaceutical composition of claim 63, and

(b) detecting the binding of the compound to amyloid deposit in the subject.

66. (New) The method of claim 65, wherein the amyloid deposit is located in the brain of a subject.

67. (New) The method of claim 65, wherein the subject is suspected of having a disease or syndrome selected from the group consisting of Alzheimer's Disease, familial Alzheimer's Disease, Down's Syndrome and homozygotes for the apolipoprotein E4 allele.

68. (New) The method of claim 65, wherein the detecting is selected from the group consisting of gamma imaging, magnetic resonance imaging and magnetic resonance spectroscopy.

69. (New) The method of claim 68, wherein the detecting is done by gamma imaging, and the gamma imaging is either PET or SPECT.

70. (New) The method of claim 65, wherein the pharmaceutical composition is administered by intravenous injection.

71. (New) The method of claim 65, wherein the ratio of (i) binding of the compound to a brain area other than the cerebellum to (ii) binding of the compound to the cerebellum, in the subject, is compared to the ratio in normal subjects.

72. (New) A method of detecting amyloid deposits in biopsy or post-mortem human or animal tissue, comprising the steps of:

(a) incubating formalin-fixed or fresh-frozen tissue with a solution of an amyloid binding compound of claim 44 to form a labeled deposit and then,

(b) detecting the labeled deposits.

73. (New) The method of claim 72 wherein the solution is composed of 25-100% ethanol, with the remainder of the solution being water, wherein the solution is saturated with the amyloid binding compound.

74. (New) The method of claim 72 wherein the solution is composed of an aqueous buffer containing 0-50% ethanol, wherein the solution contains 0.0001 to 100 μM of the amyloid binding compound.

75. (New) The method of claim 72 wherein the detecting is effected by microscopic techniques selected from the group consisting of bright-field, fluorescence, laser-confocal, and cross-polarization microscopy.

76. (New) A method of quantifying the amount of amyloid in biopsy or post-mortem tissue, comprising the steps of:

a) incubating a radiolabeled derivative of an amyloid binding compound of claim 44 with a homogenate of biopsy or post-mortem tissue, wherein at least one of the substituents R^1-R^{10} of the compound is labeled with a radiolabel selected from the group consisting of ^{125}I, ^{3}H, and a carbon-containing substituent as specified in claim 44, wherein at least one carbon is ^{14}C,

b) separating the tissue-bound from the tissue-unbound radiolabeled derivative of the amyloid binding compound,

c) quantifying the tissue-bound radiolabeled derivative of the amyloid binding compound, and

d) converting the units of tissue-bound radiolabeled derivative of the amyloid binding compound to units of micrograms of amyloid per 100 mg of tissue by comparison with a standard.

77. (New) A method of distinguishing an Alzheimer's disease brain from a normal brain, comprising the steps of:

a) obtaining tissue from (i) the cerebellum and (ii) another area of the same brain other than the cerebellum, from normal subjects and from subjects suspected of having Alzheimer's disease;

b) incubating the tissues with a radiolabeled derivative of an amyloid binding compound of claim 44 derivative so that amyloid in the tissue binds with the radiolabeled derivative of a the amyloid binding compound;

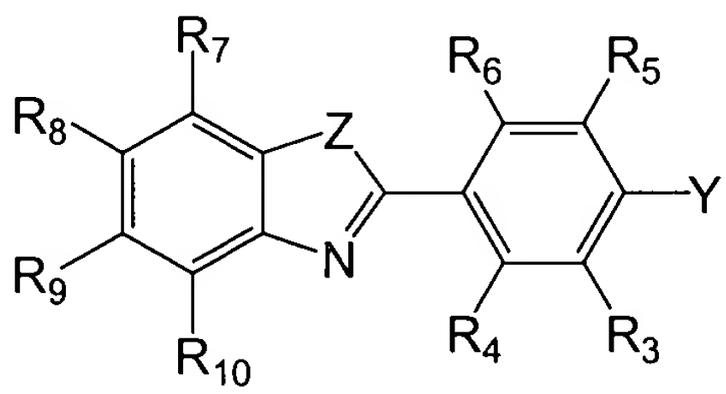
c) quantifying the amount of amyloid bound to the radiolabeled derivative of the amyloid binding compound, by administering a detectable quantity of the pharmaceutical composition comprising the amyloid binding compound with a pharmaceutically acceptable carrier, and detecting the binding of the amyloid binding compound to amyloid deposit in the subject;

d) calculating the ratio of the amount of amyloid in the area of the brain other than the cerebellum to the amount of amyloid in the cerebellum;

e) comparing the ratio for amount of amyloid in the tissue from normal subjects with ratio for amount of amyloid in tissue from subjects suspected of having Alzheimer's disease; and

f) determining the presence of Alzheimer's disease if the ratio from the brain of a subject suspected of having Alzheimer's disease is above 90% of the ratios obtained from the brains of normal subjects.

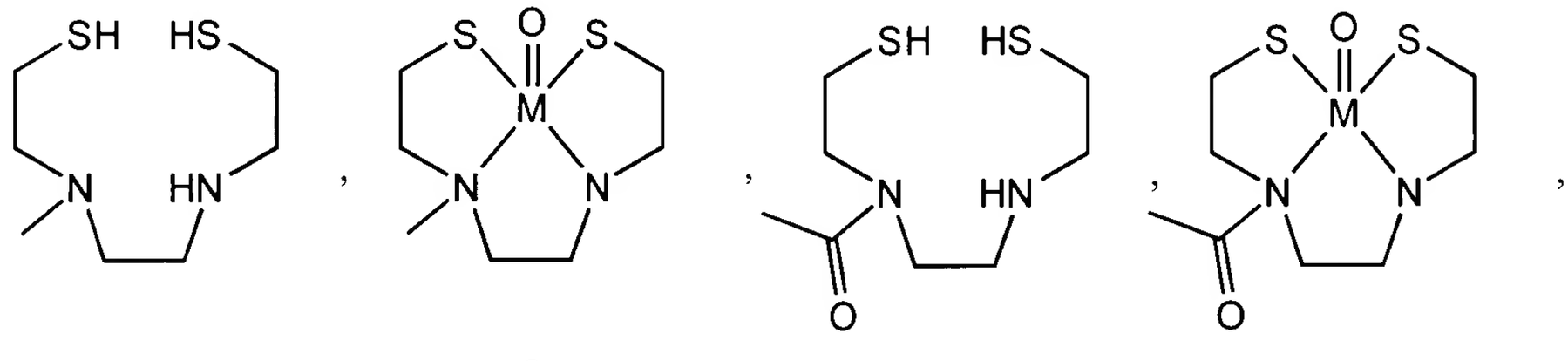
78. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:

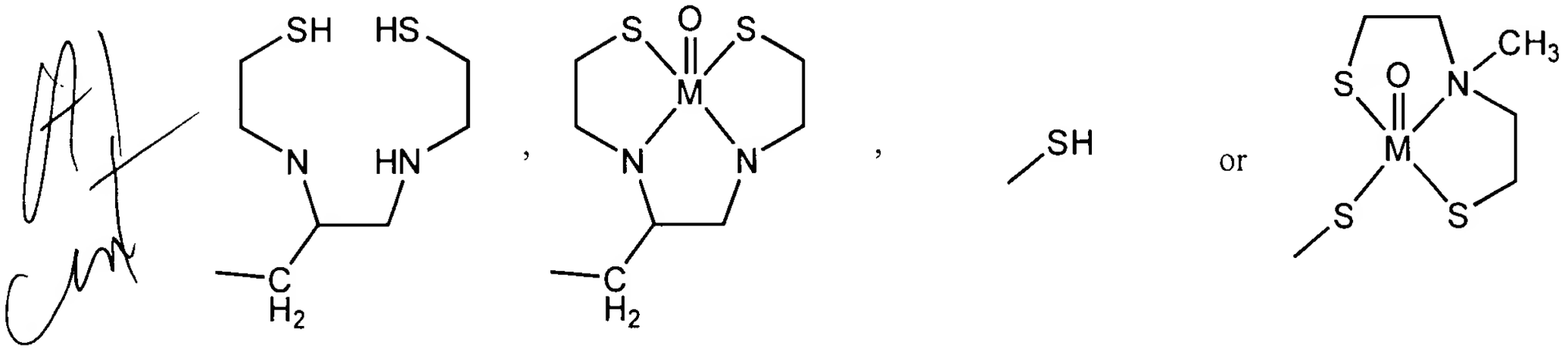


wherein Z is S; Y is OH; and

wherein R^3-R^8 and R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the

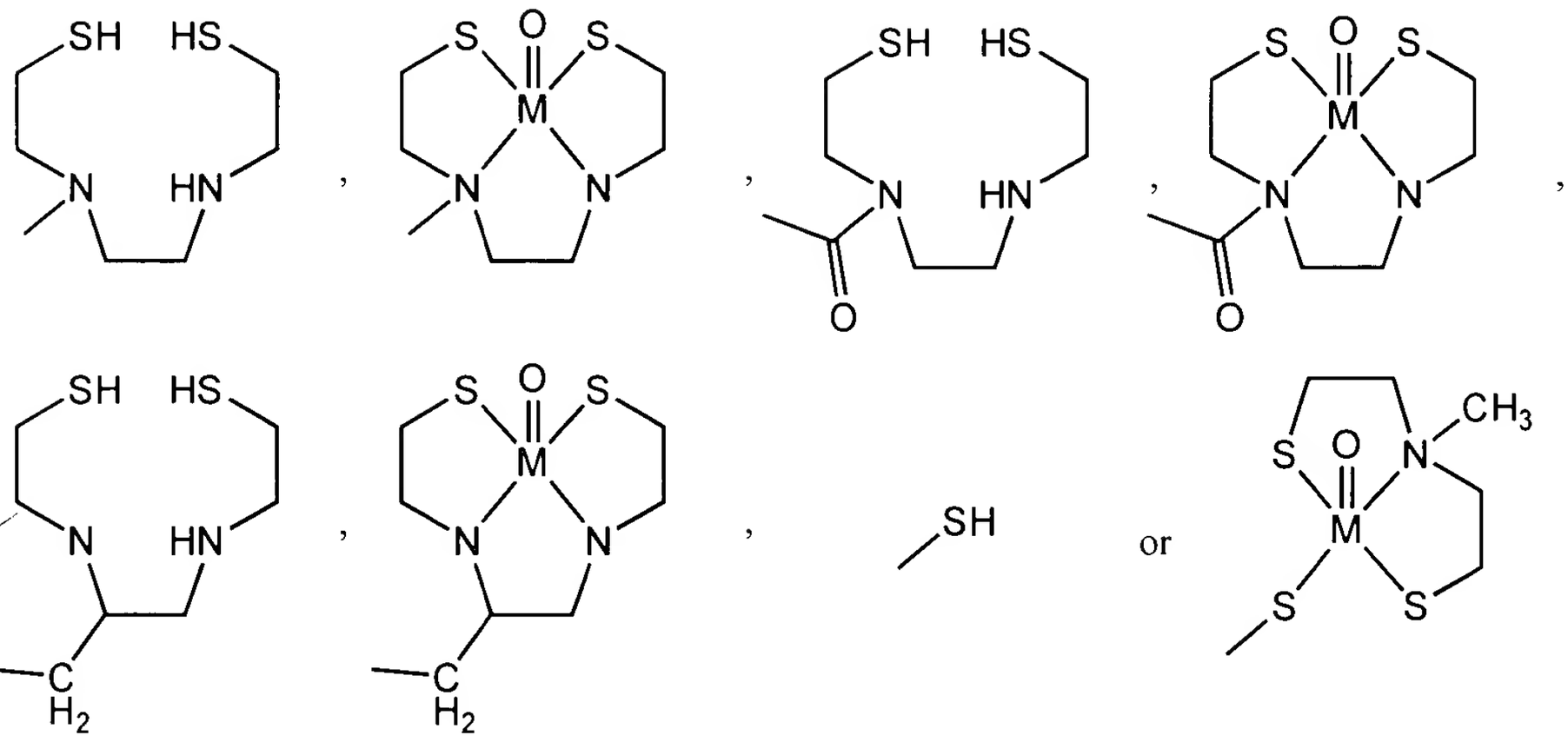
form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:





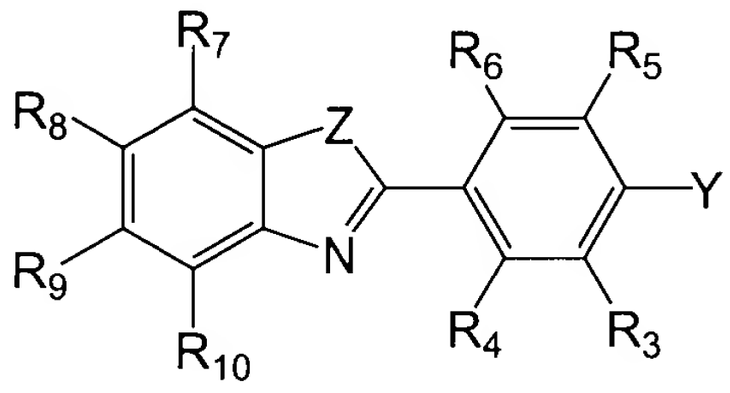
wherein M is selected from the group consisting of Tc and Re; and

wherein R^9 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OCH_3, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



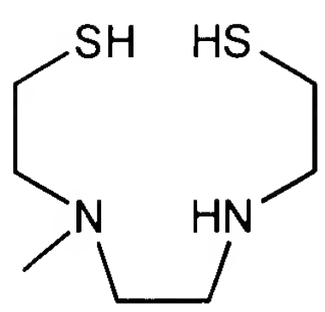
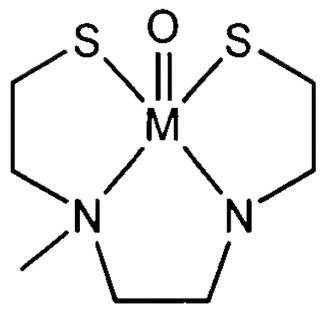
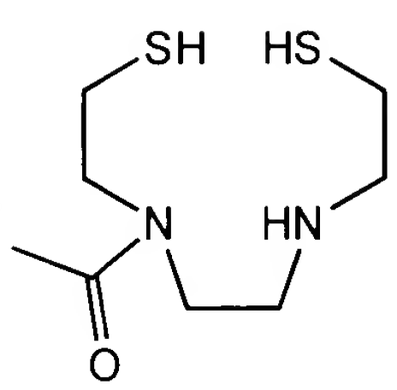
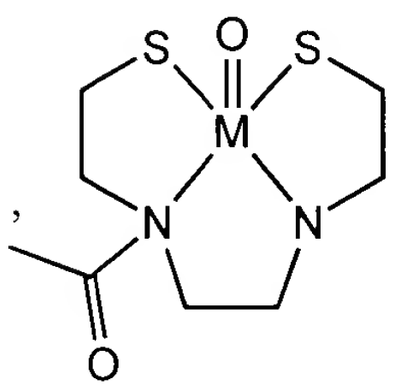
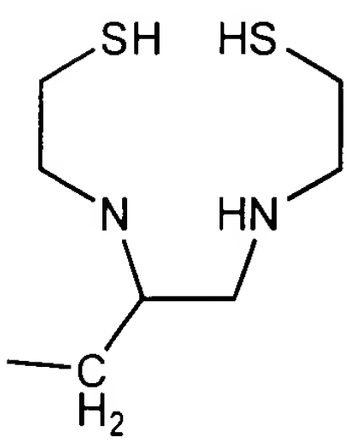
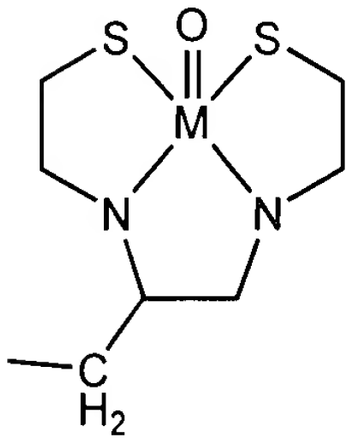
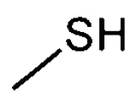
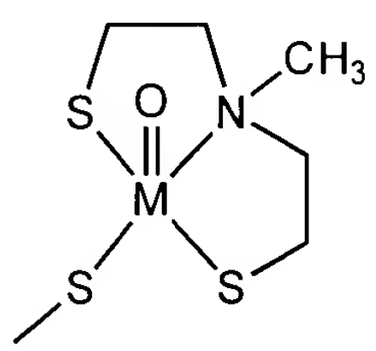
wherein M is selected from the group consisting of Tc and Re.

79. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



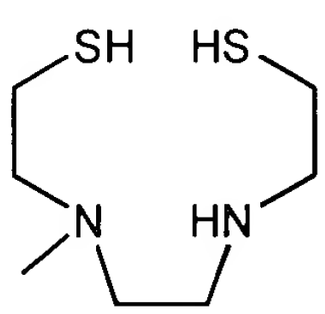
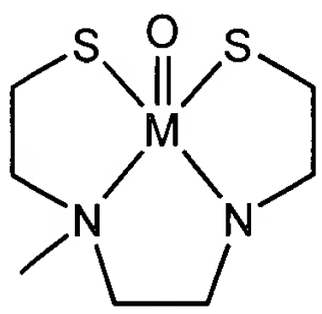
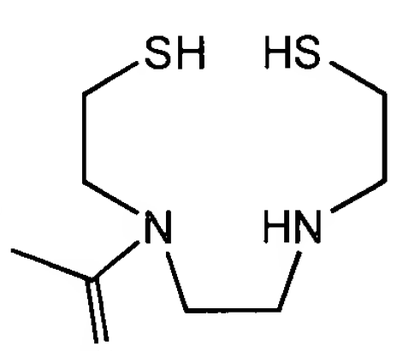
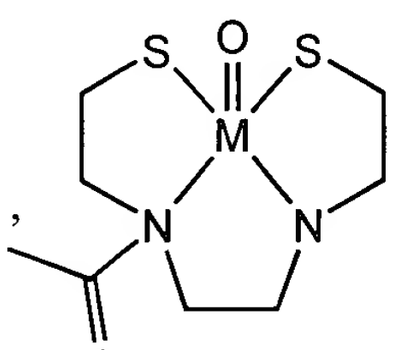
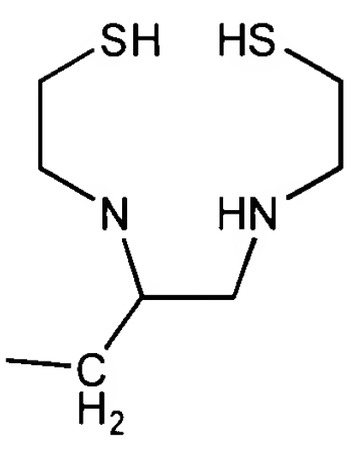
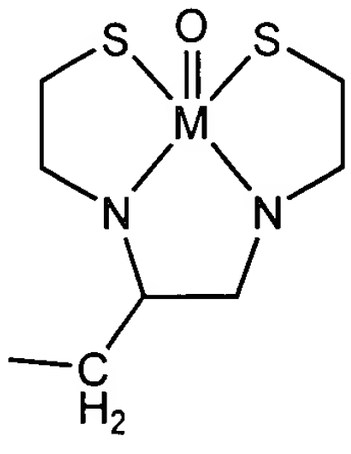
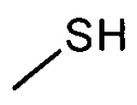
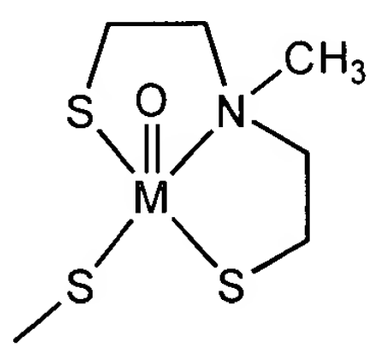
wherein Z is S; Y is OCH_3; and

wherein R^3, R^4, R^5 , R^6, R^7 and R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R′, $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R′, OR′, SR′, COOR′, R_{ph}, CR′ = CR′-R_{ph}, CR_2′-CR_2′-R_{ph} (wherein R′ is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

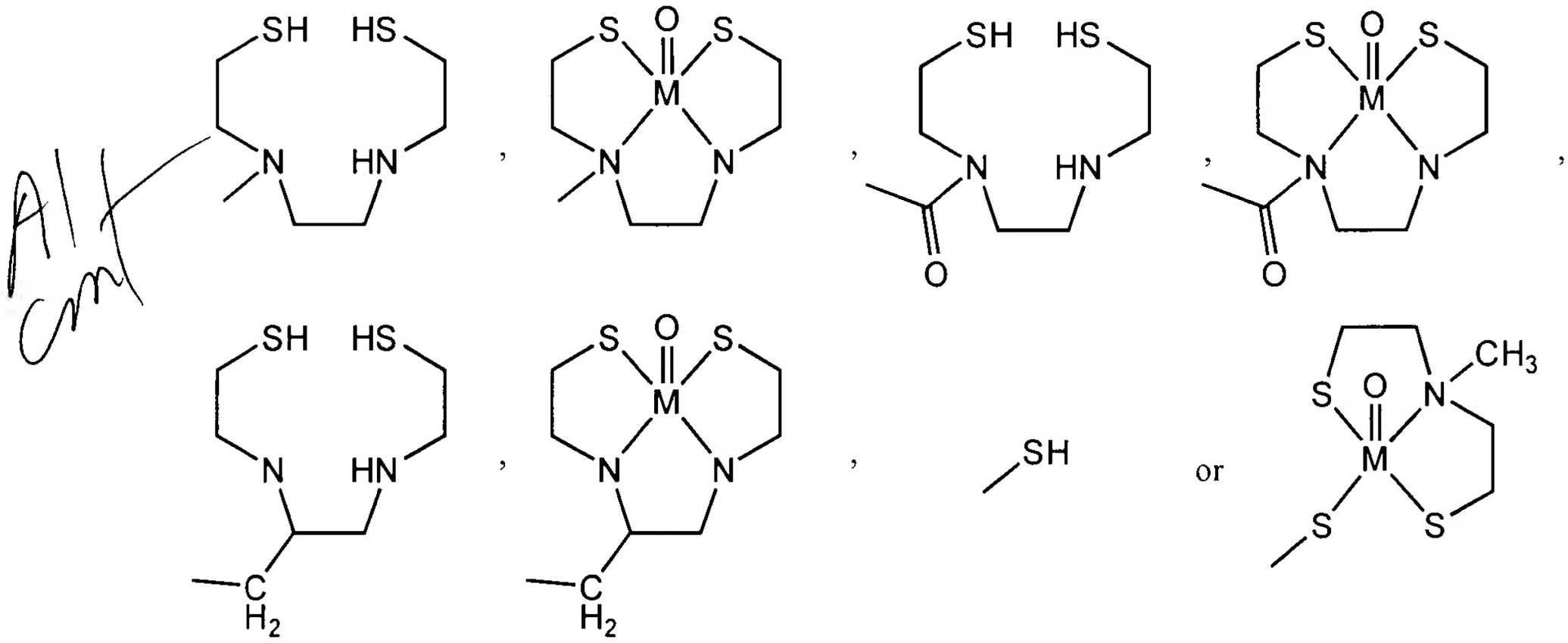
wherein M is selected from the group consisting of Tc and Re; and

wherein R^8 is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $NHCH_3$, $N(CH_3)_2$, NHC_2H_5, $N(C_2H_5)_2$, NHC_3H_7, $N(C_3H_7)_2$, NHC_4H_9, $N(C_4H_9)_2$, (C = O)$N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

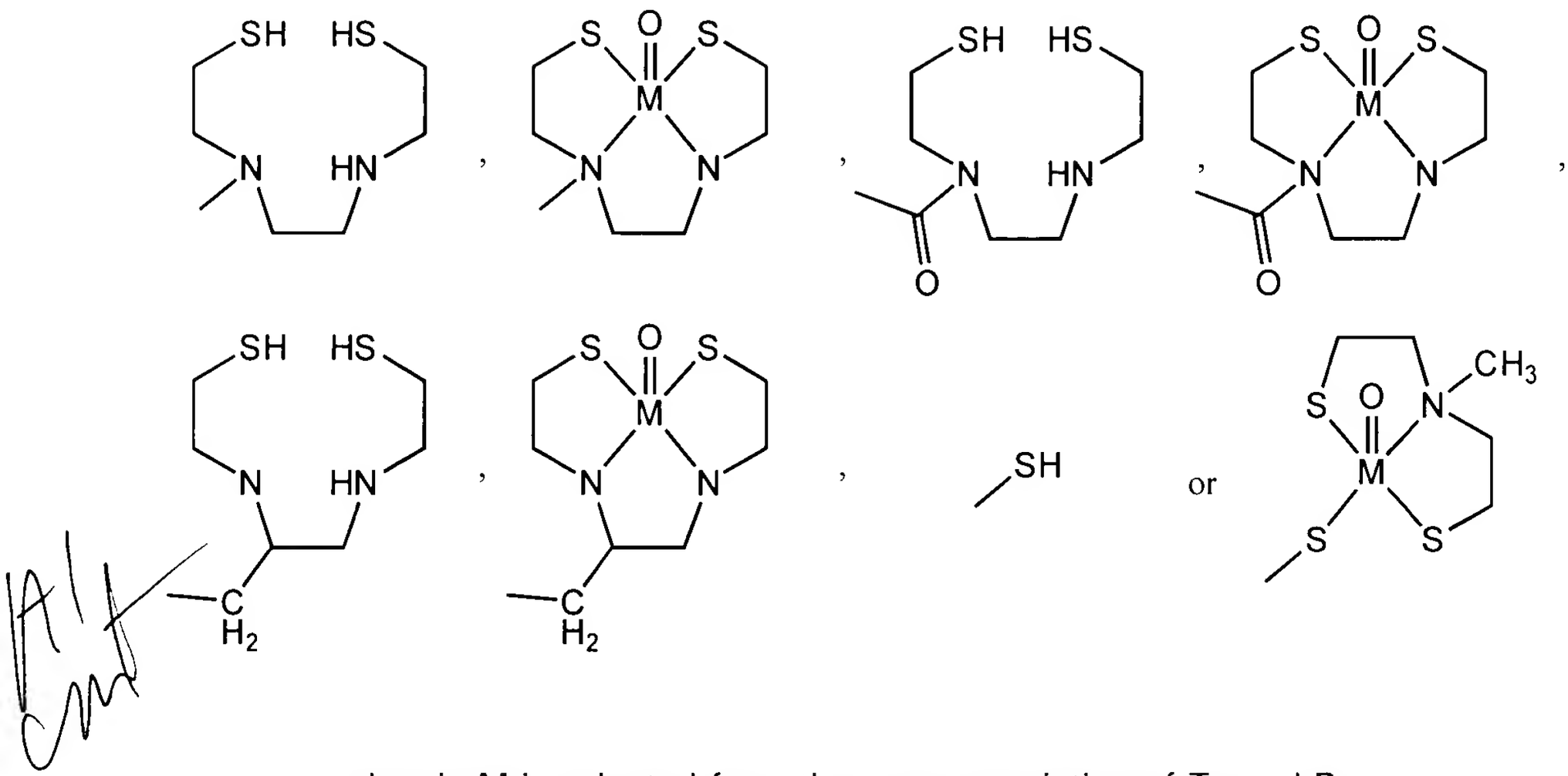
wherein M is selected from the group consisting of Tc and Re; and

wherein R^9 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', NH_2, $NHCH_3$, NHC_2H_5, $N(C_2H_5)_2$, NHC_3H_7, $N(C_3H_7)_2$, NHC_4H_9, $N(C_4H_9)_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OH, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



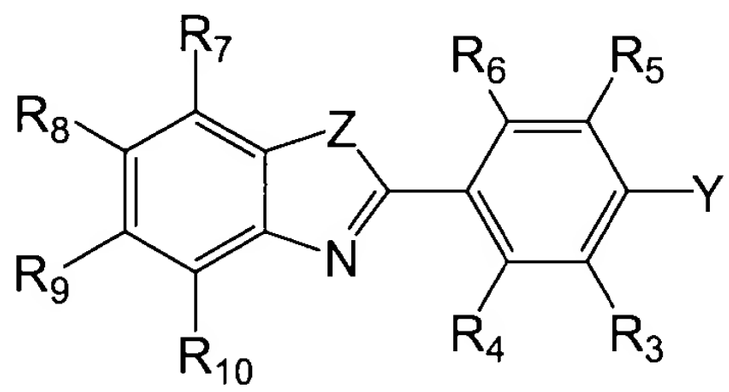
wherein M is selected from the group consisting of Tc and Re; and

wherein at least one of R^{3-10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re.

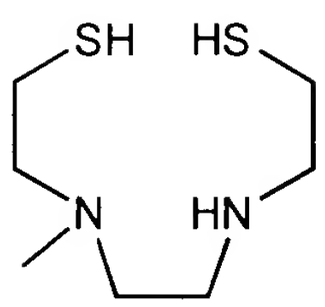
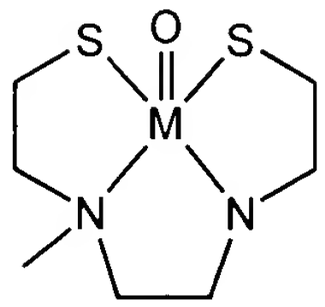
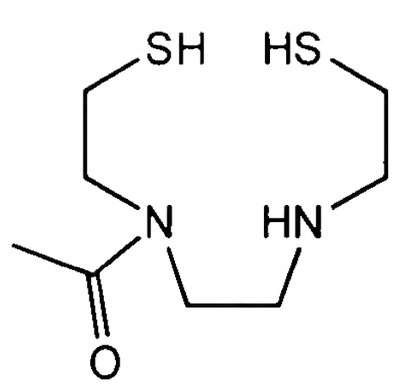
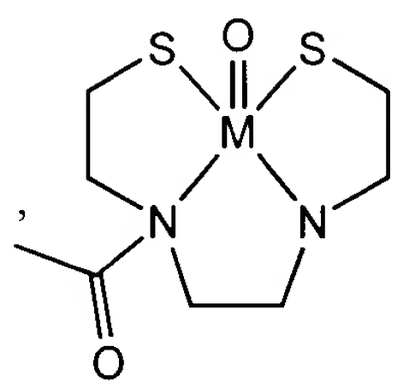
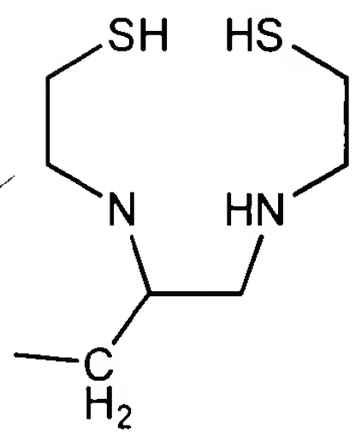
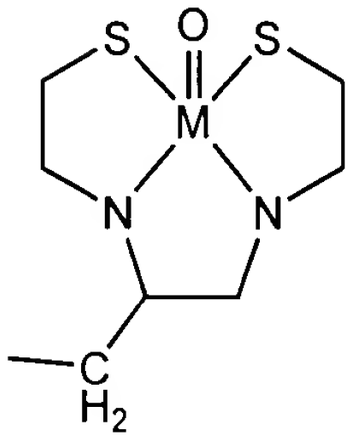
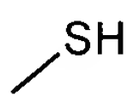
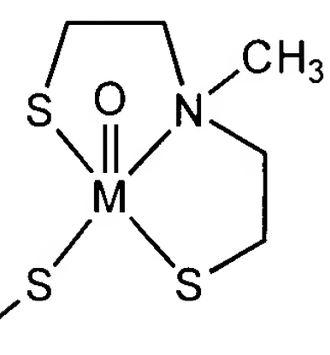
80. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Z is S; Y is OR^2;

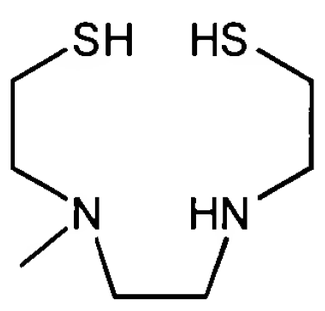
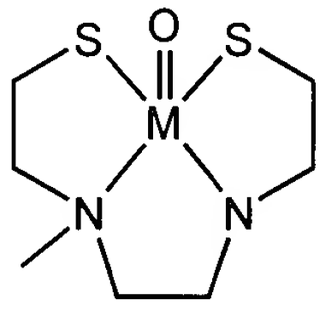
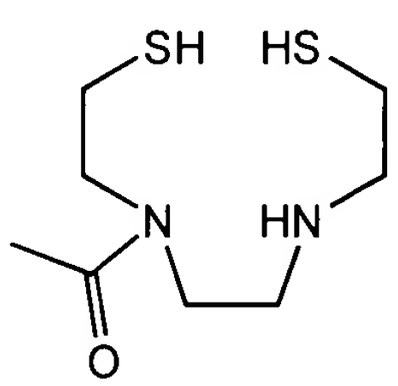
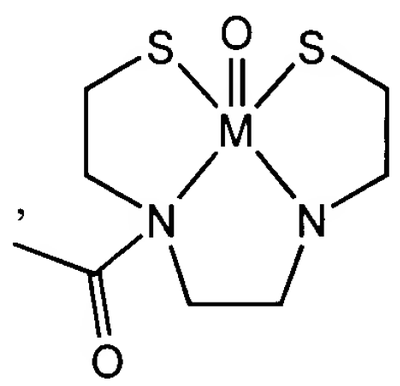
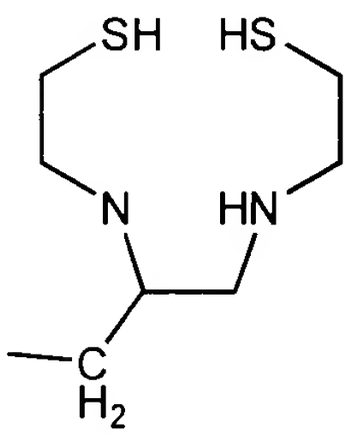
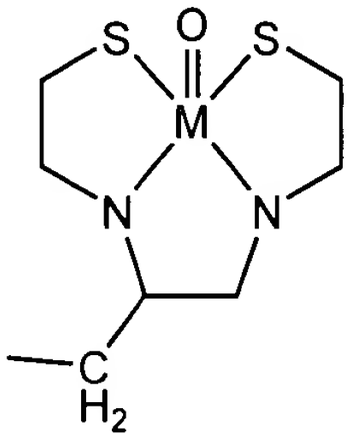
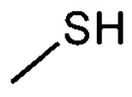
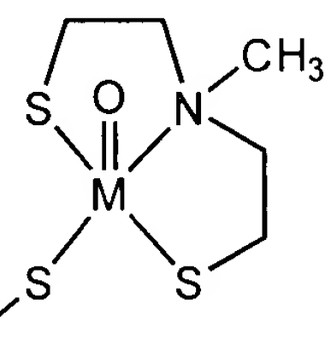
wherein R^2 is selected from the group consisting of ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3 and R' is H or a lower alkyl group), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R', R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 1, 2, 3, or 4 and R_{ph} represents an optionally substituted phenyl group); or

wherein R^2 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is:

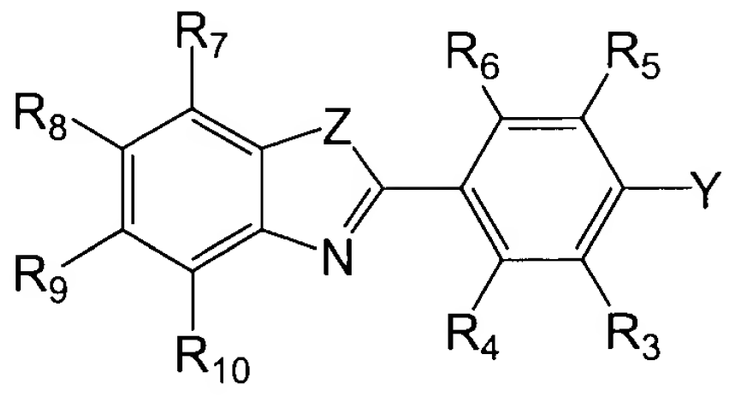
wherein M is selected from the group consisting of Tc and Re; and

wherein R^{3-10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

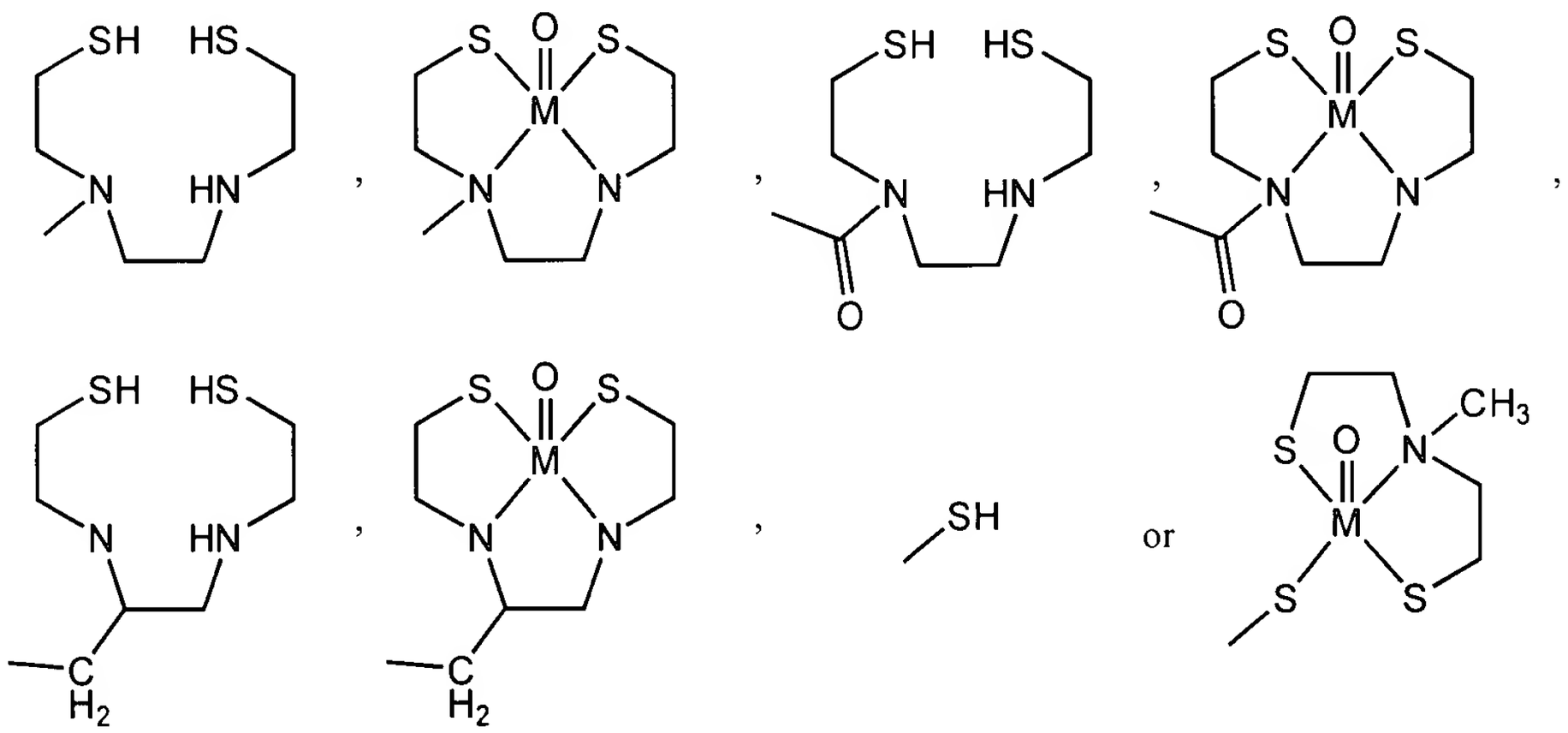
wherein M is selected from the group consisting of Tc and Re.

81. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Y is NR^1R^2; Z is S; R^1 and R^2 are both H;

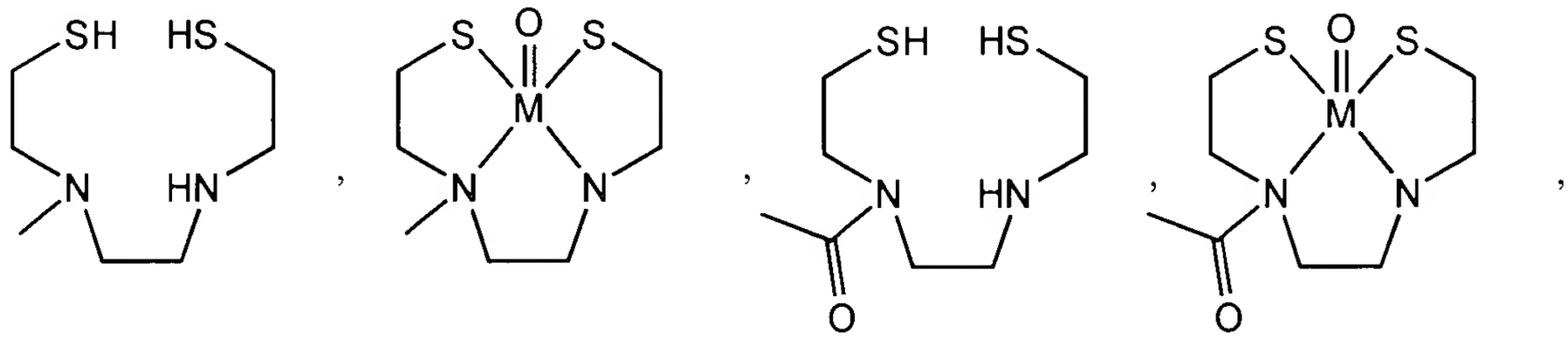
R^3 and R^5 are independently selected from the group consisting of H, F, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OCH_3, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

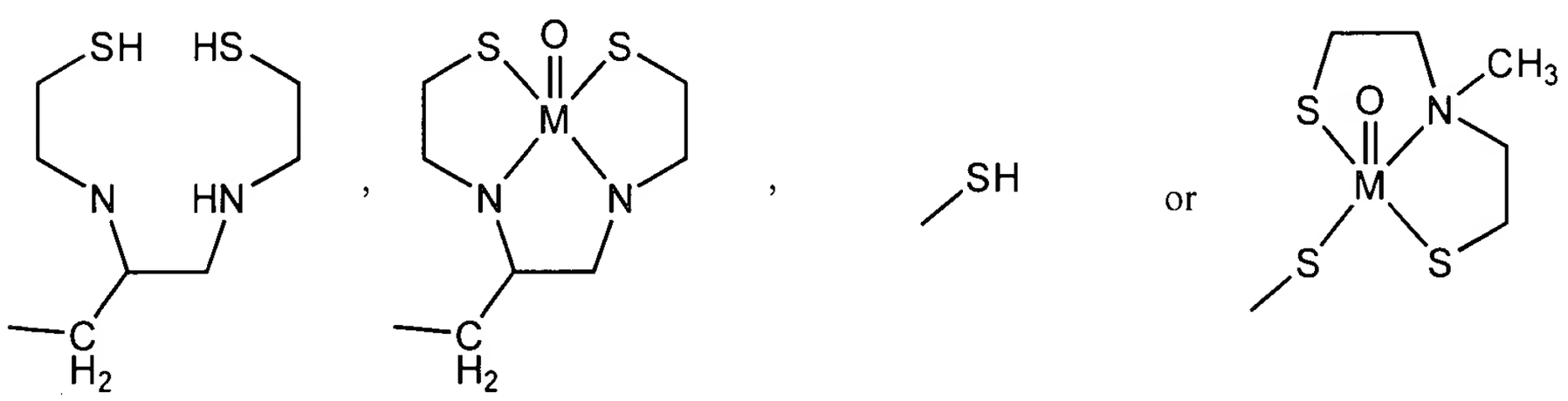


wherein M is selected from the group consisting of Tc and Re;

R^4 and R^6 are independently selected from the group consisting of H, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-

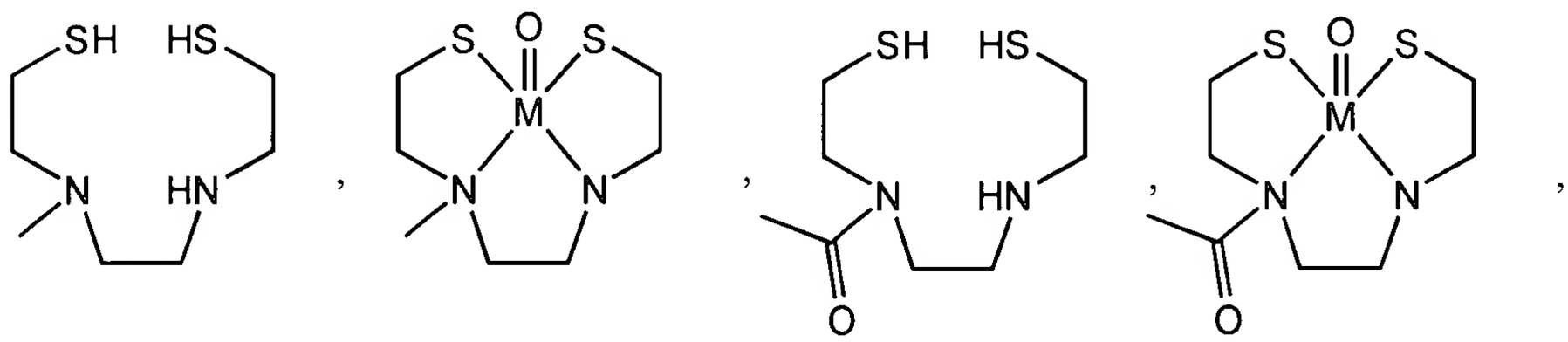
L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

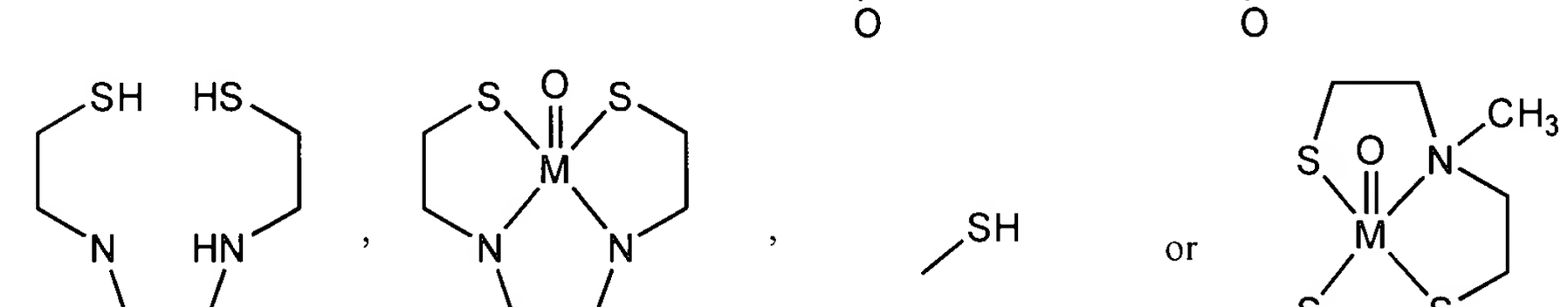




wherein M is selected from the group consisting of Tc and Re;

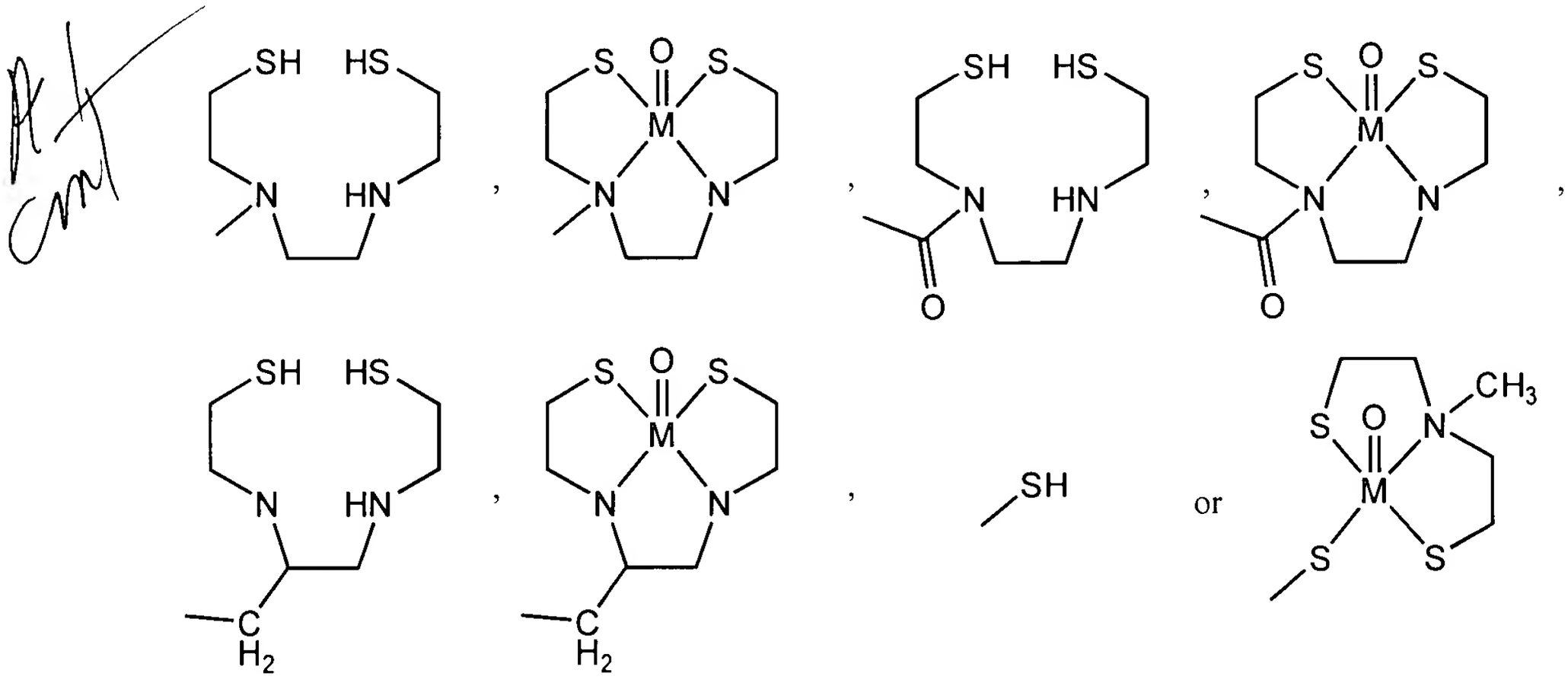
R^7 and R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:





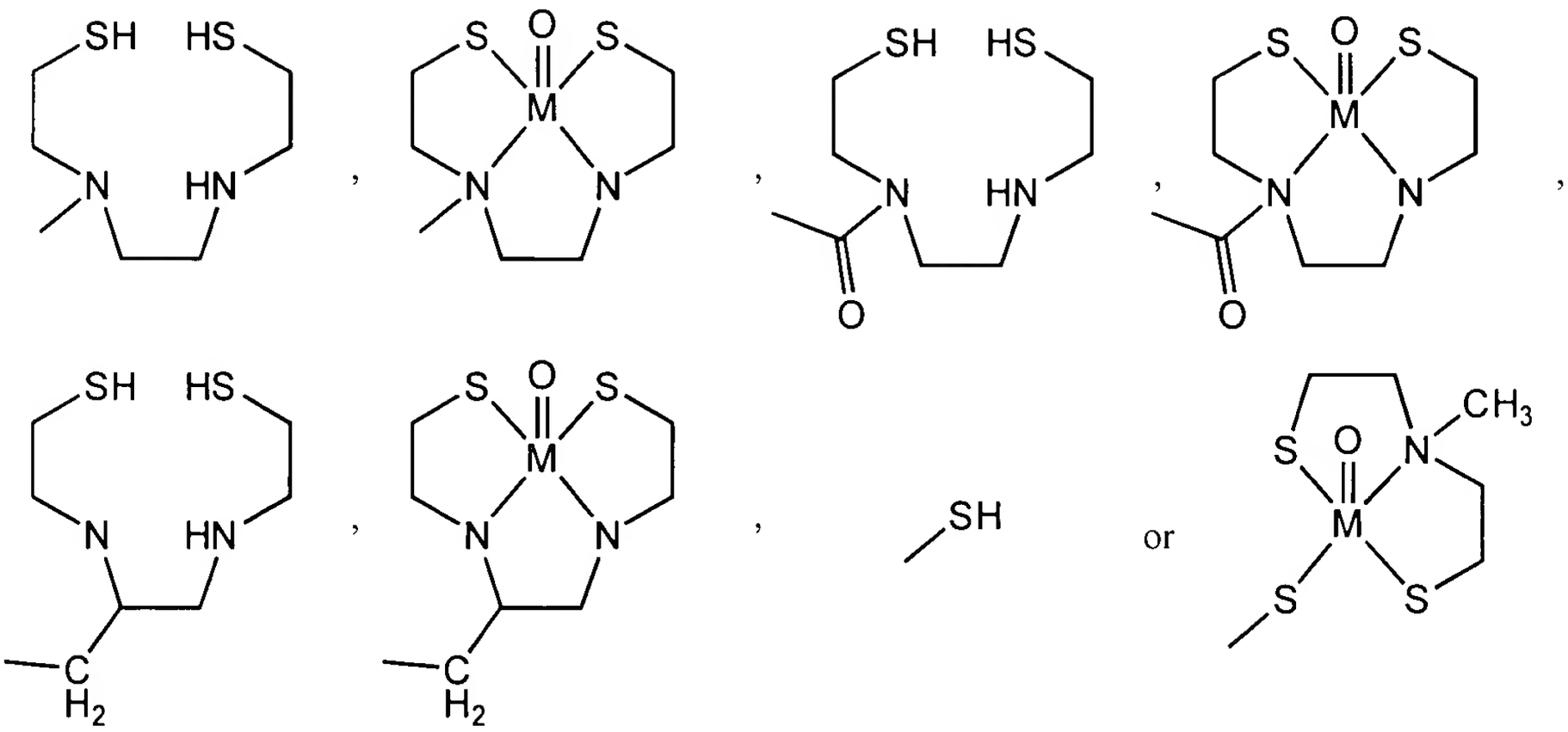
wherein M is selected from the group consisting of Tc and Re;

R^8 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $NHCH_3$, NHC_2H_5, $N(C_2H_5)_2$, NHC_3H_7, $N(C_3H_7)_2$, NHC_4H_9, $N(C_4H_9)_2$, NO_2, $(C=O)N(R')_2$, $O(CO)R'$, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, $CR'=CR'$-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



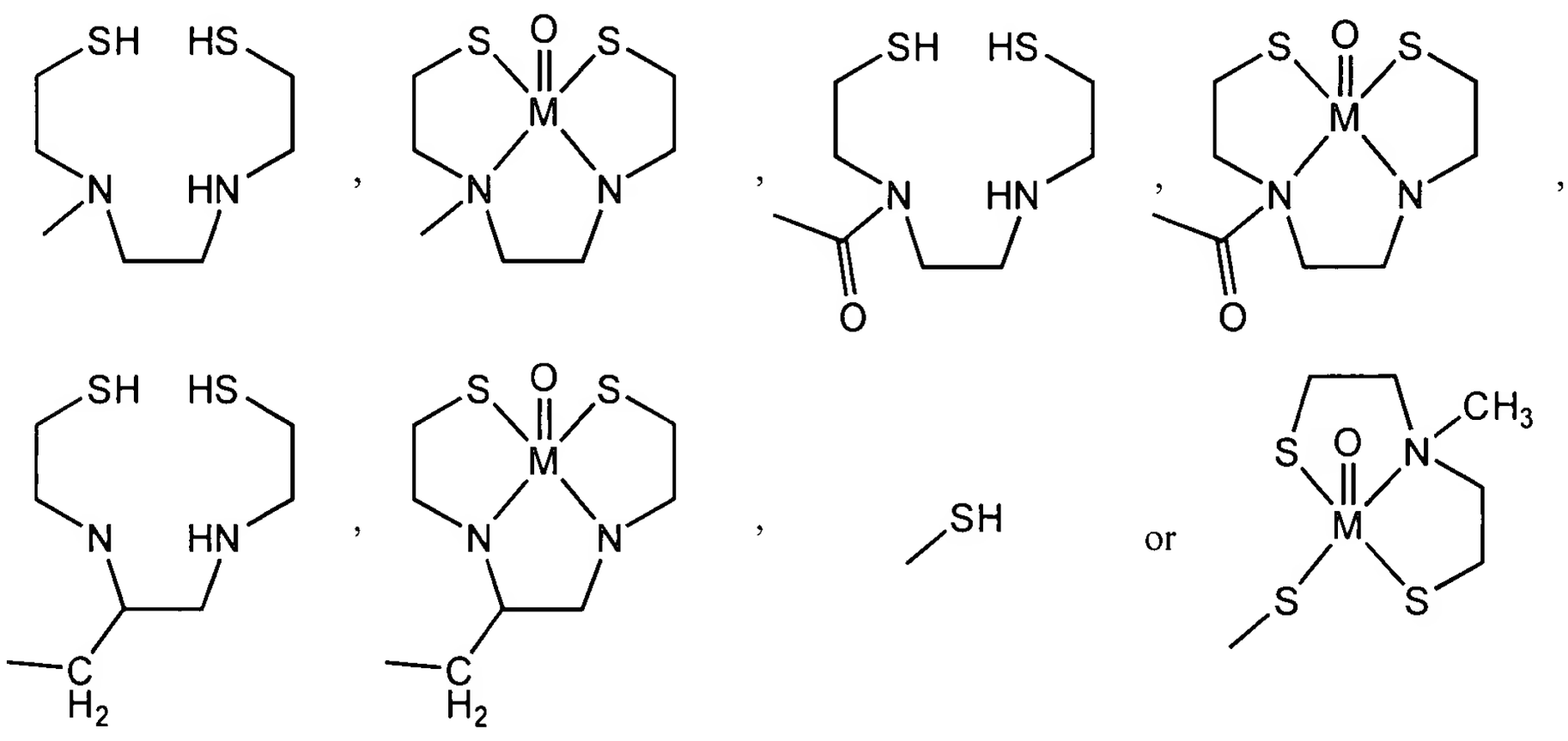
wherein M is selected from the group consisting of Tc and Re;

R^9 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, $O(CO)R'$, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, $CR'=CR'$-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



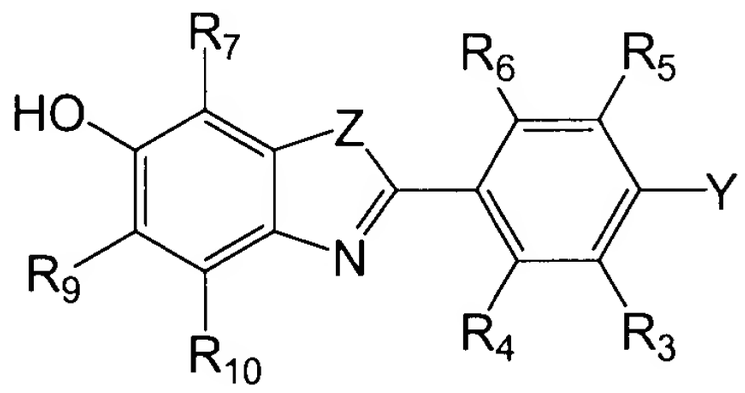
wherein M is selected from the group consisting of Tc and Re;

wherein at least one of R^3-R^{10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



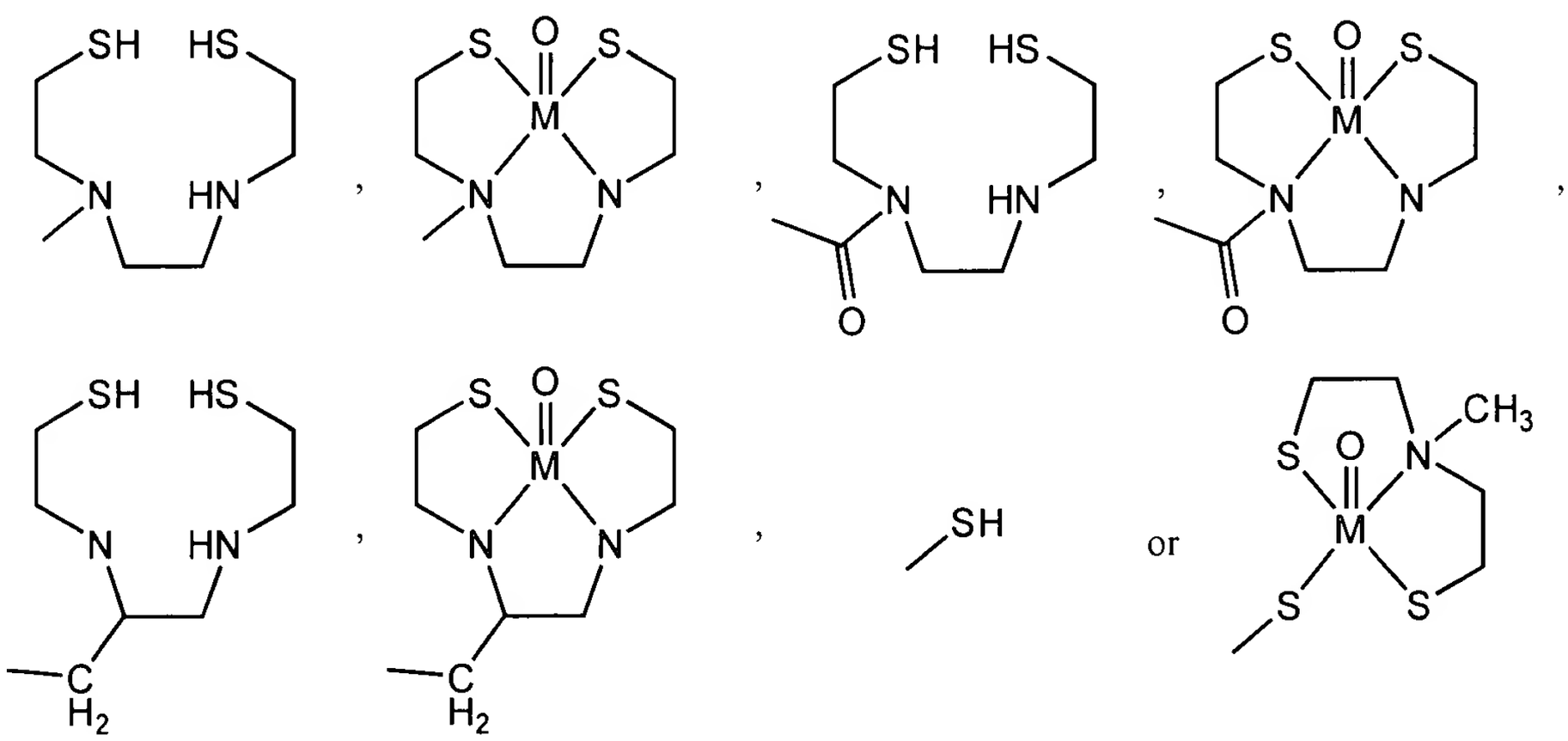
wherein M is selected from the group consisting of Tc and Re.

82. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Y is NR^1R^2; Z is S; R^1 and R^2 are both H;

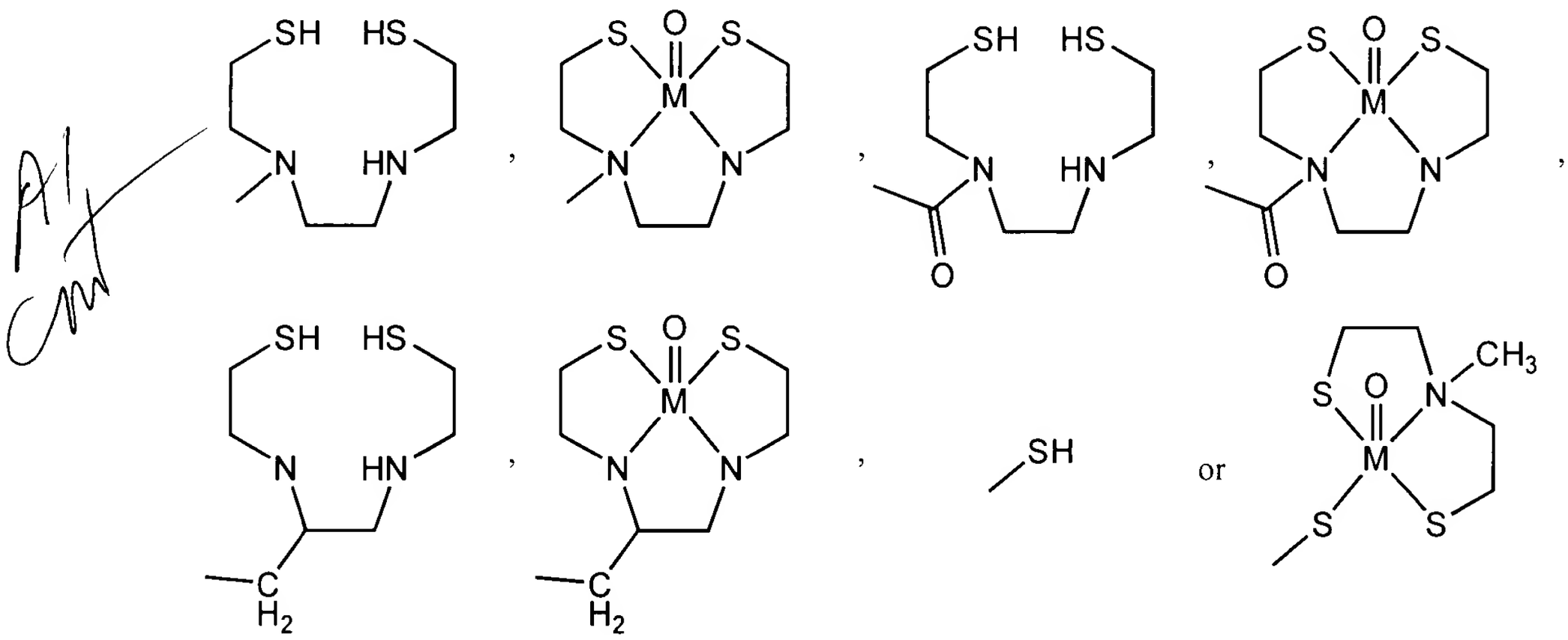
R^3, R^5, R^7, R^9 and R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re;

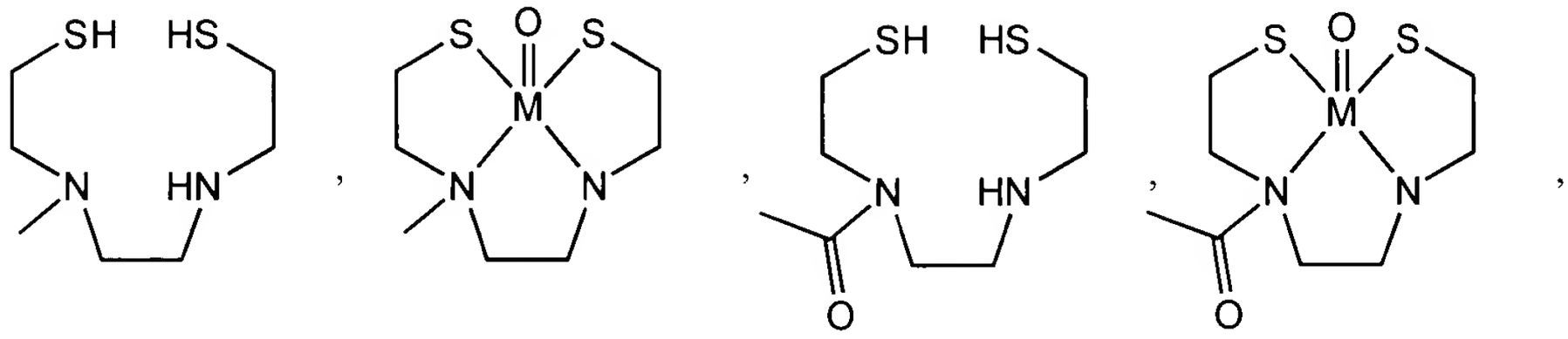
R^4 and R^6 are independently selected from the group consisting of H, F, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2,

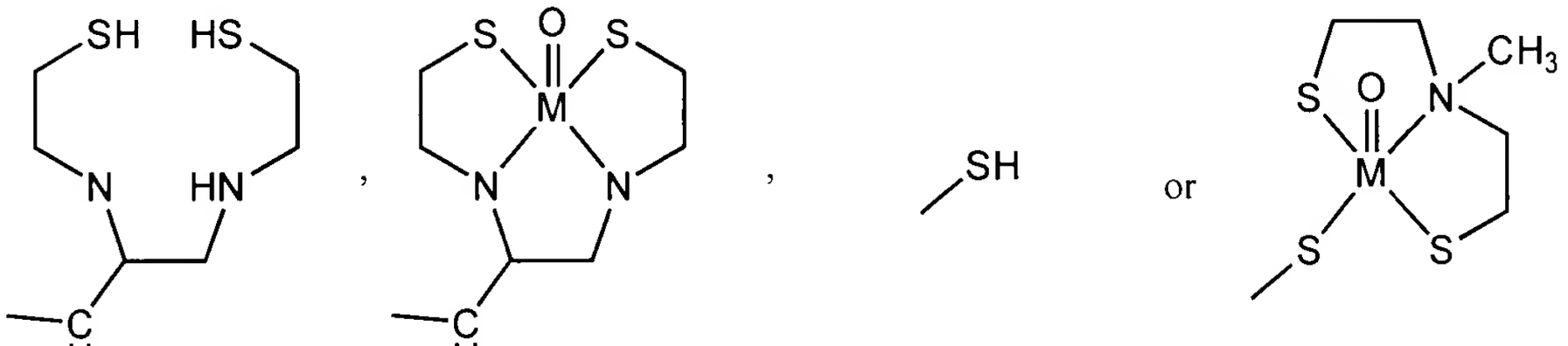
$(C=O)N(R')_2$, $O(CO)R'$, OR', SR', $COOR'$, R_{ph}, $CR'=CR'\text{-}R_{ph}$, $CR_2'\text{-}CR_2'\text{-}R_{ph}$ (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, $-CH_2O-$ and $-CH_2NH-$; W is $-(CH_2)_n$ where n=0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re;

wherein at least one of R^3-R^7 and R^9-R^{10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n=1, 2, or 3), CF_3, $CH_2\text{-}CH_2X$, $O\text{-}CH_2\text{-}CH_2X$, $CH_2\text{-}CH_2\text{-}CH_2X$, $O\text{-}CH_2\text{-}CH_2\text{-}CH_2X$ (wherein X=F, Cl, Br or I), CN, $(C=O)\text{-}R'$, $N(R')_2$, NO_2, $(C=O)N(R')_2$, $O(CO)R'$, OR', SR', $COOR'$, R_{ph}, $CR'=CR'\text{-}R_{ph}$, $CR_2'\text{-}CR_2'\text{-}R_{ph}$ (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, $-CH_2O-$ and $-CH_2NH-$; W is $-(CH_2)_n$ where n=0,1,2,3,4, or 5; and L is:

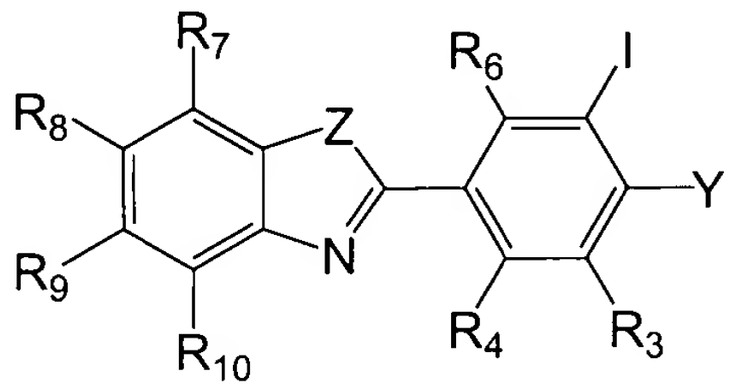




or

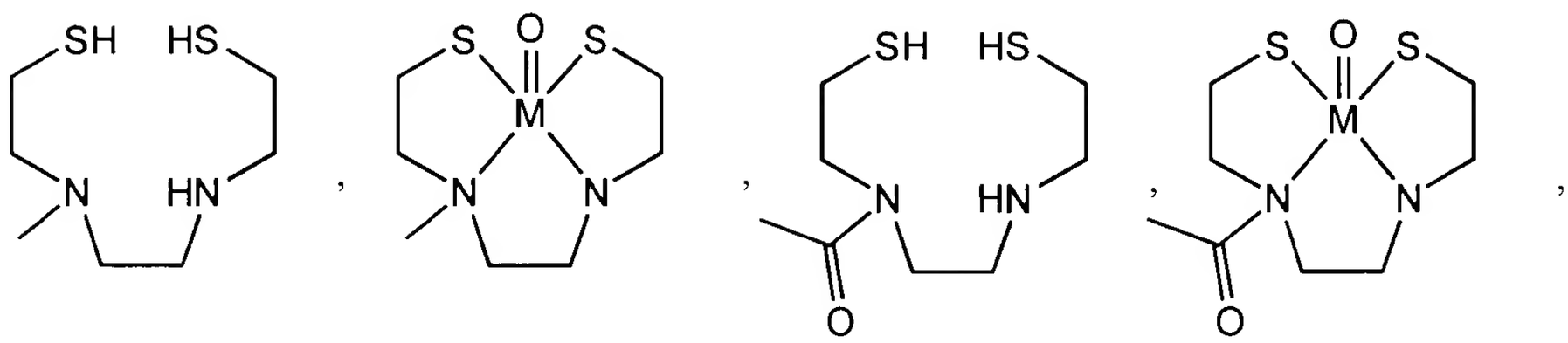
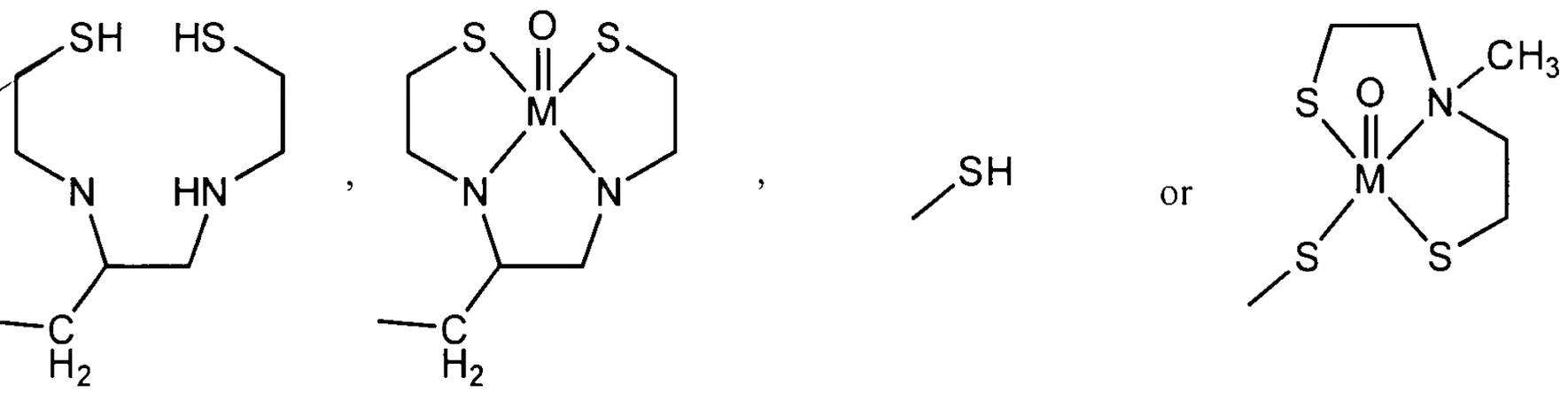
wherein M is selected from the group consisting of Tc and Re.

83. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



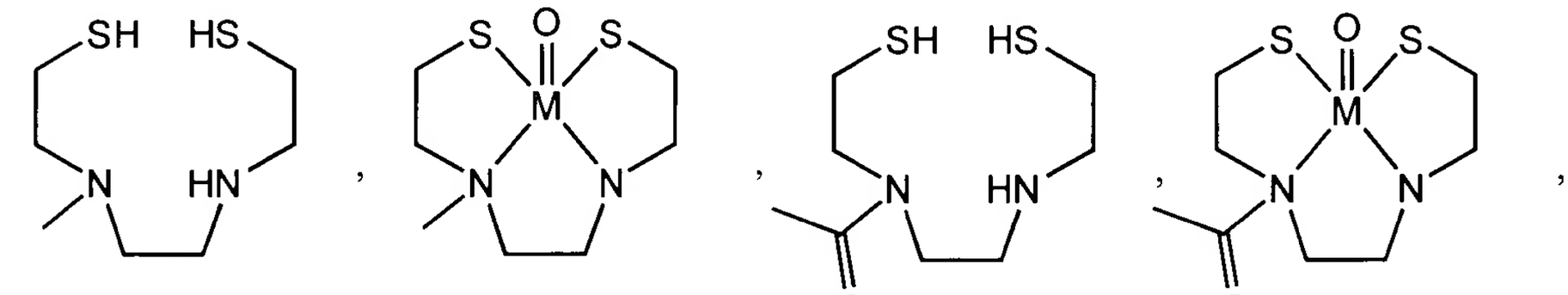
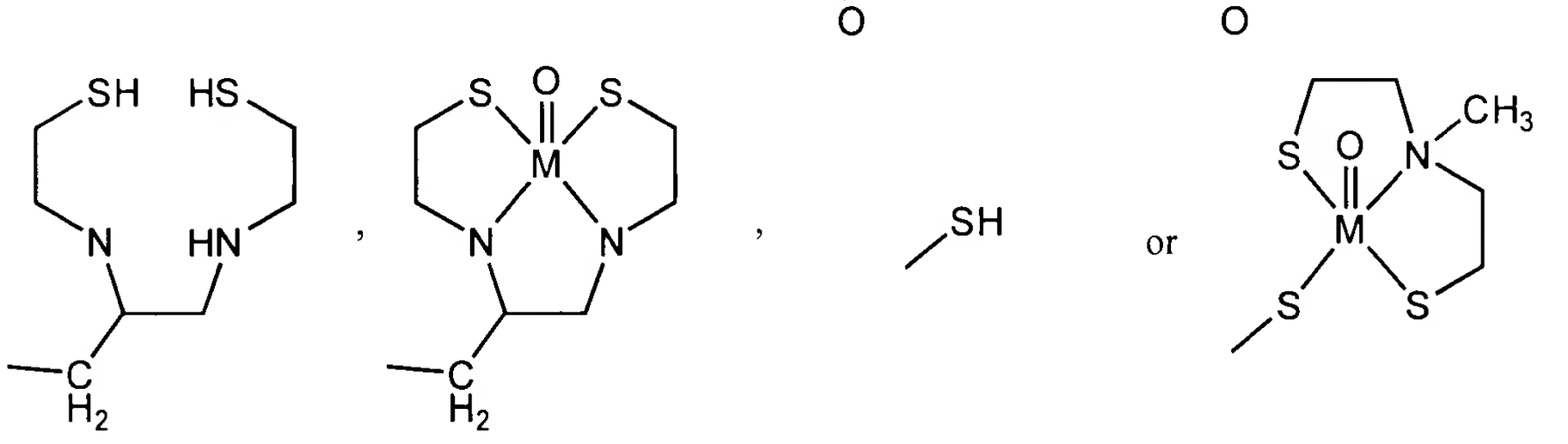
wherein Y is NR^1R^2; Z is S; R^1 and R^2 are both H;

R^3, R^4, R^6, R^7, R^9 and R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

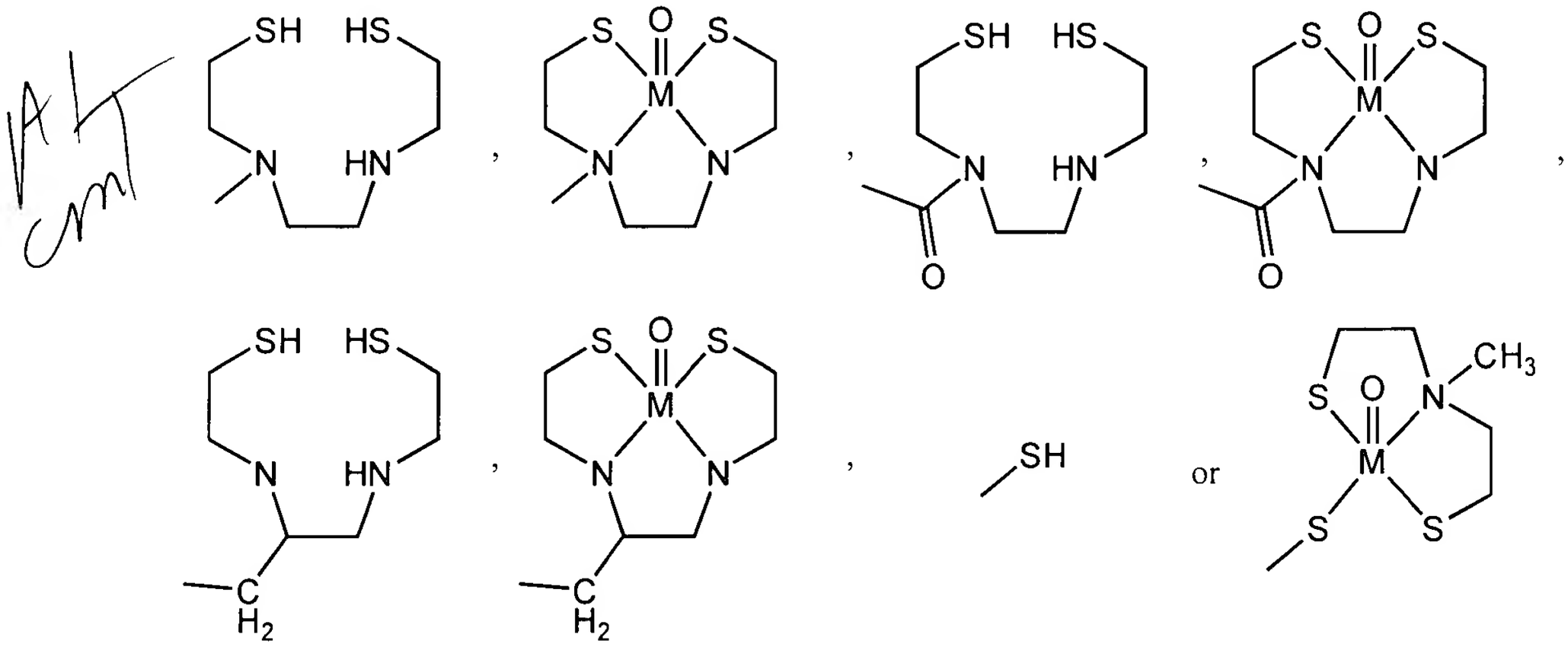
wherein M is selected from the group consisting of Tc and Re;

R^8 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, (C = O)$N(R')_2$, O(CO)R', OH, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

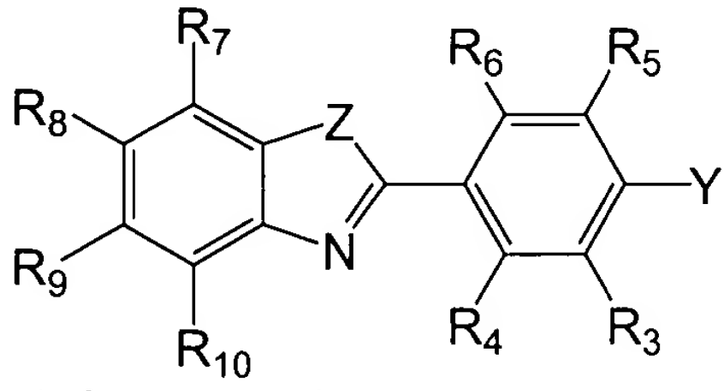
wherein M is selected from the group consisting of Tc and Re;

wherein at least one of R^3, R^4, and R^6-R^{10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is –$(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re.

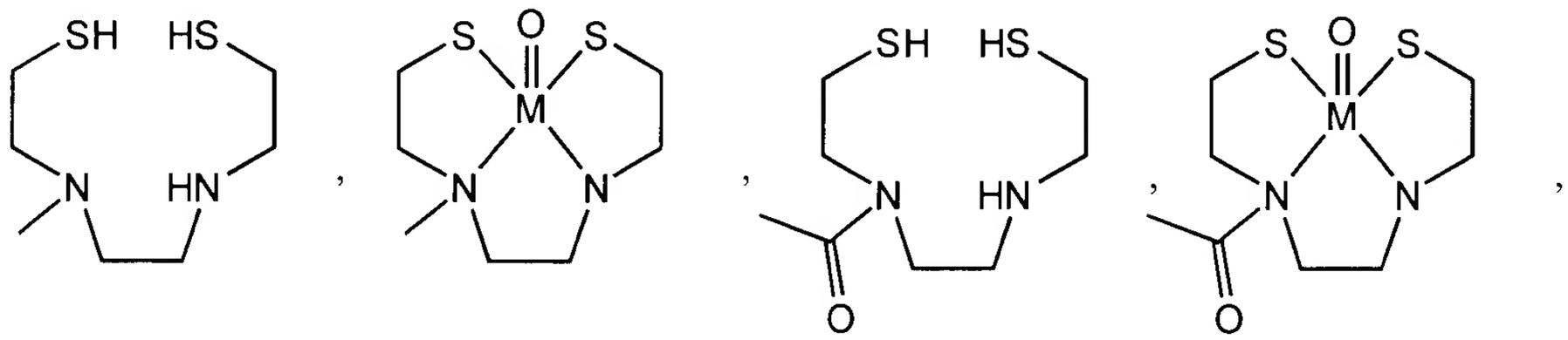
84. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:

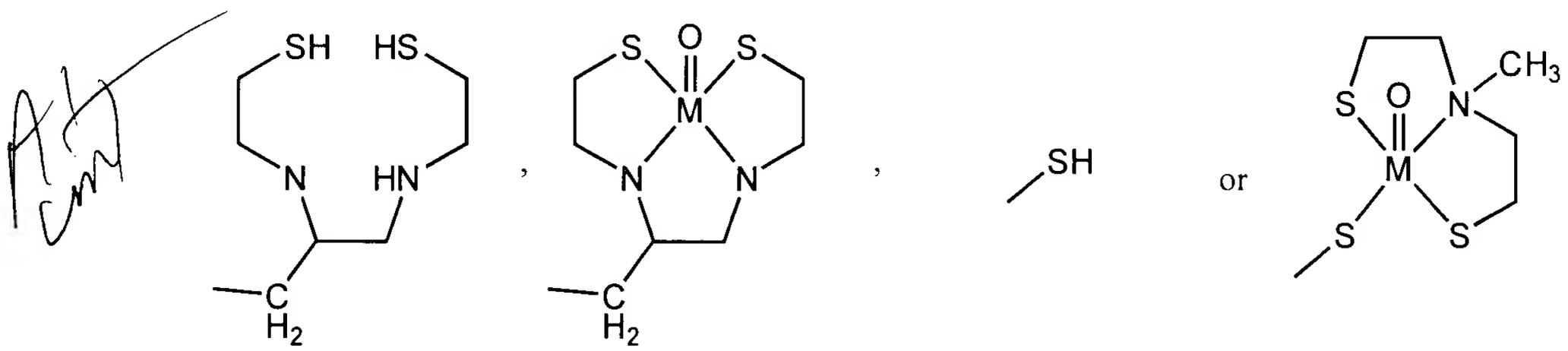


wherein Y is NR^1R^2; Z is S; R^1 is H;

wherein R^2 is selected from the group consisting of a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3 and R' is H or a lower alkyl group), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 2, 3, or 4 and R_{ph} represents an optionally substituted phenyl group); or

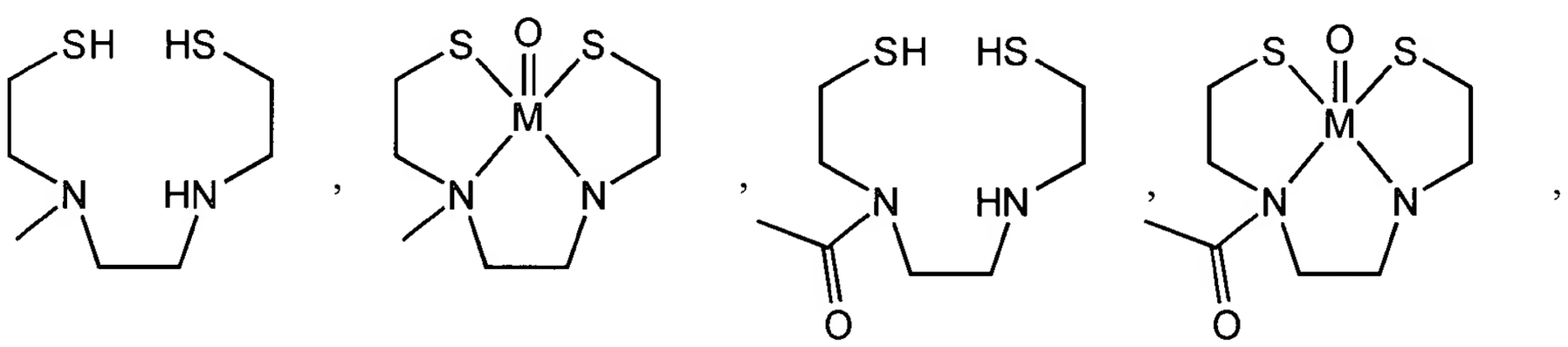
wherein R^2 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is:

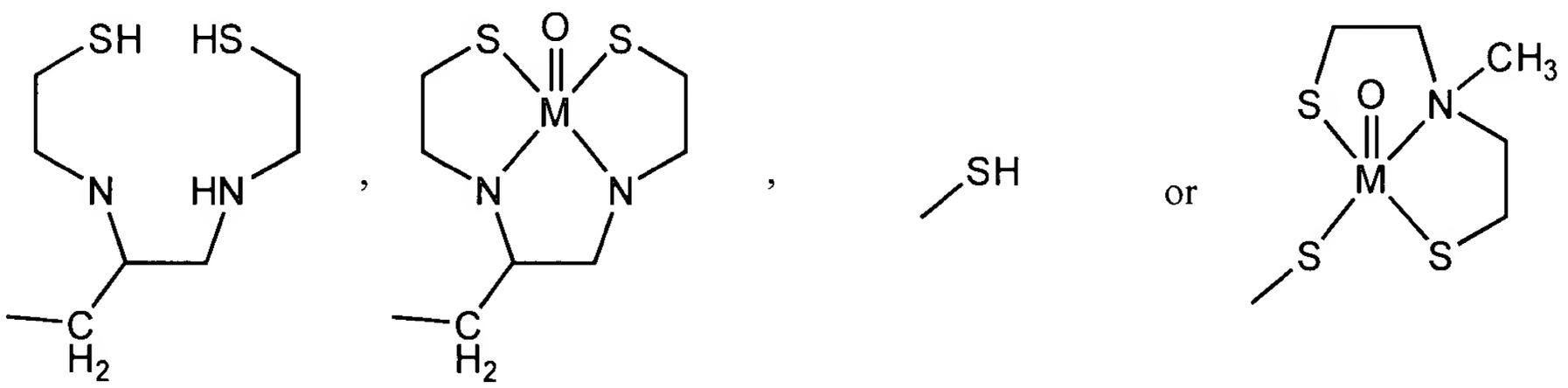




wherein M is selected from the group consisting of Tc and Re;

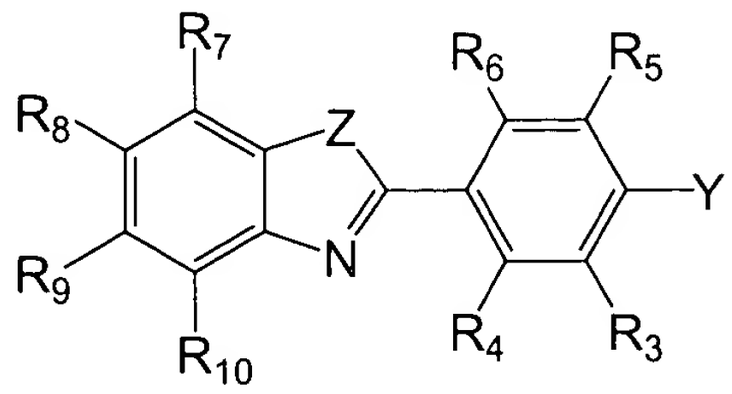
R^3 - R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, $-CH_2O-$ and $-CH_2NH-$; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:





wherein M is selected from the group consisting of Tc and Re.

85. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:

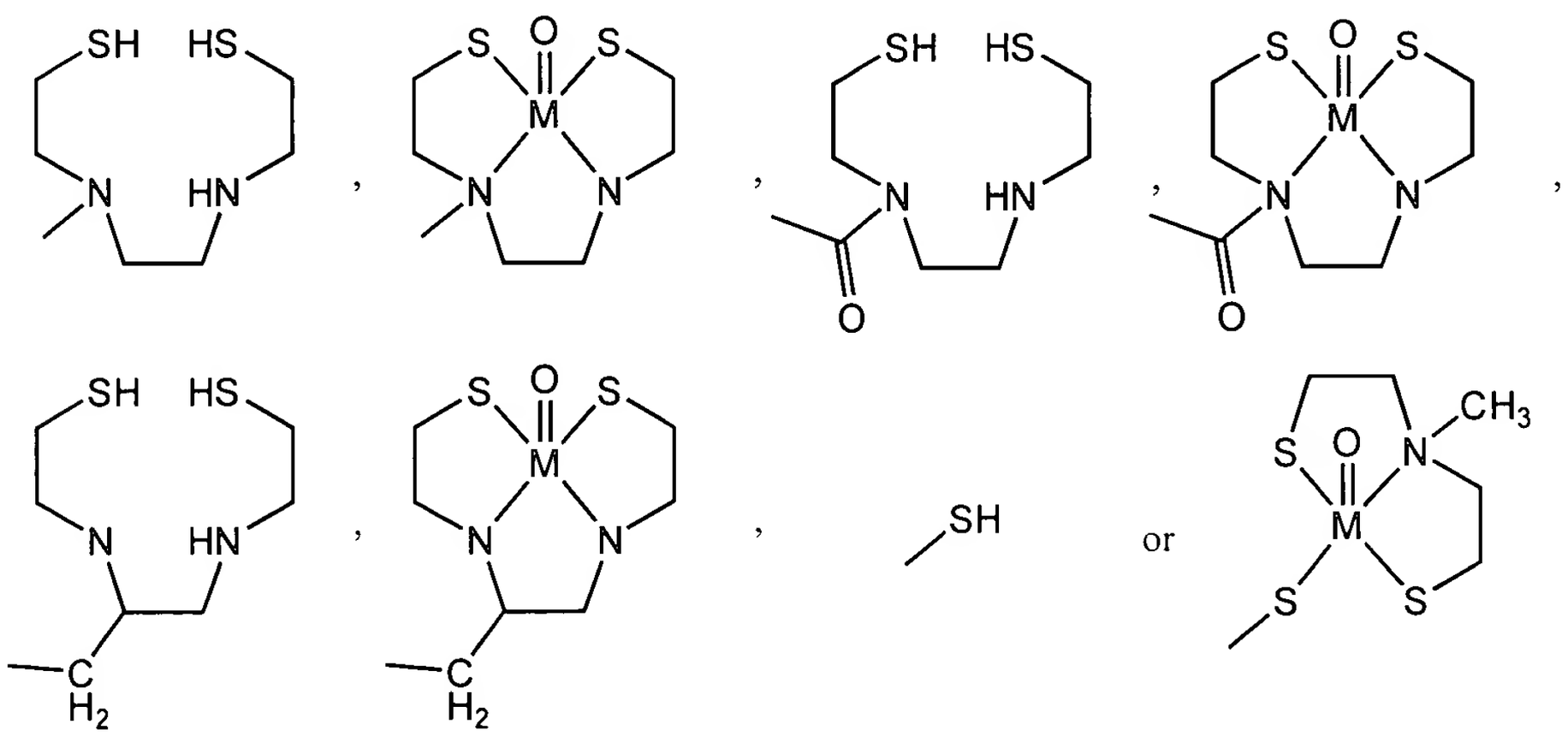


wherein Y is NR^1R^2; Z is S;

wherein R^1 is H and R^2 is CH_2R_{ph} or (C=O)-R' (wherein R' is H or a lower alkyl group); or

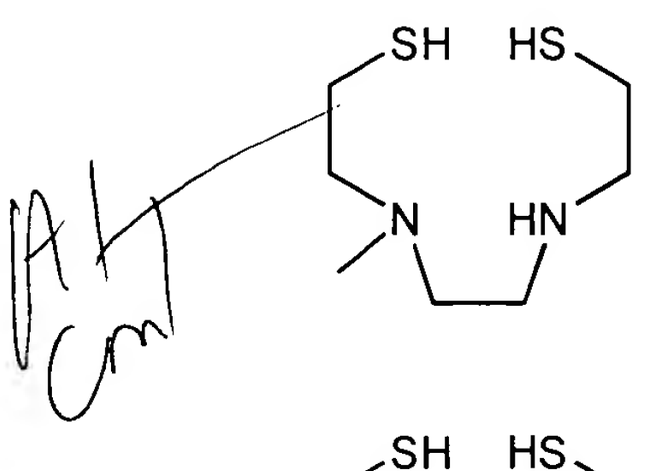
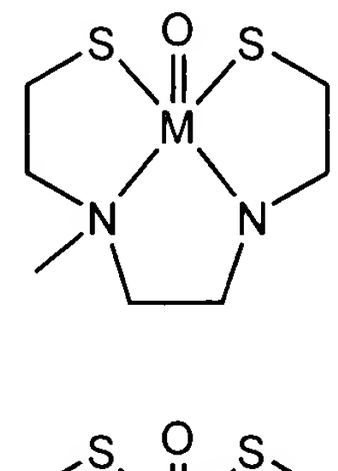
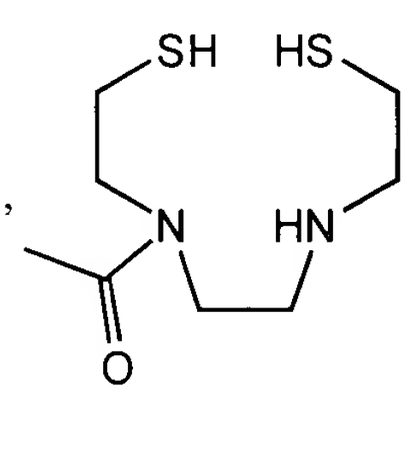
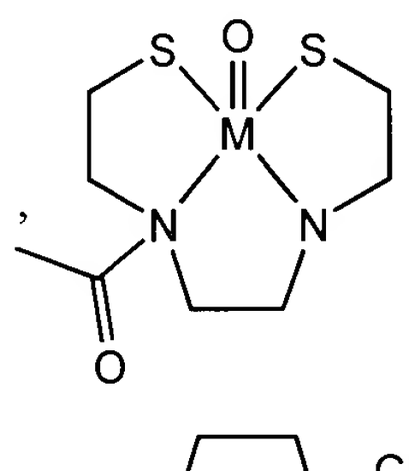
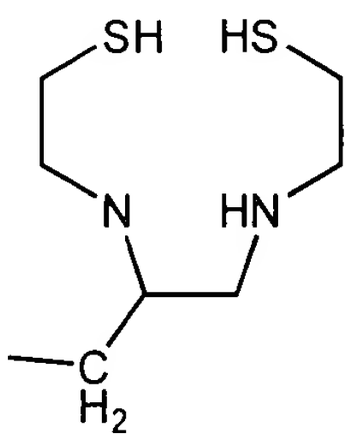
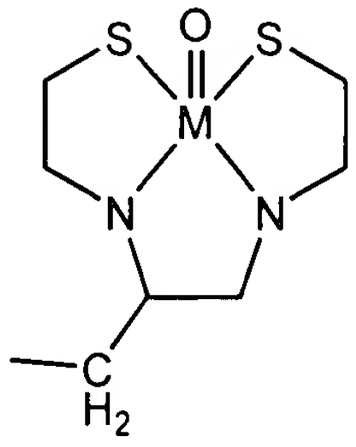
wherein R^1 and R^2 are both methyl or both ethyl;

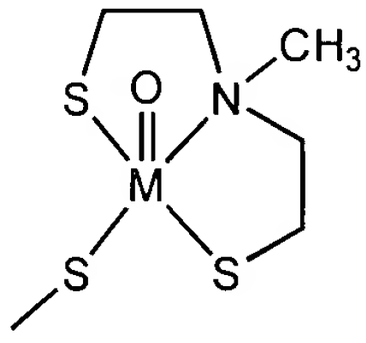
wherein each R^3-R^7 and R^{10} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n=1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X=F, Cl, Br or I), CN, (C=O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR'=CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n=0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re;

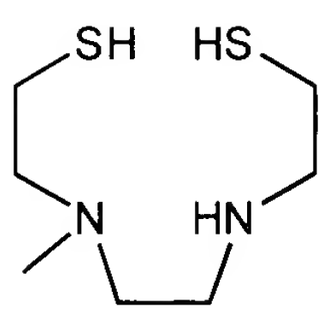
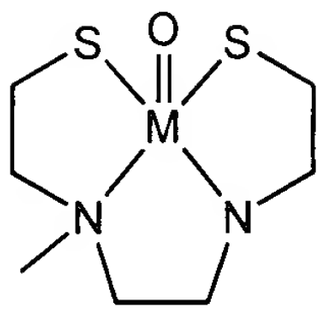
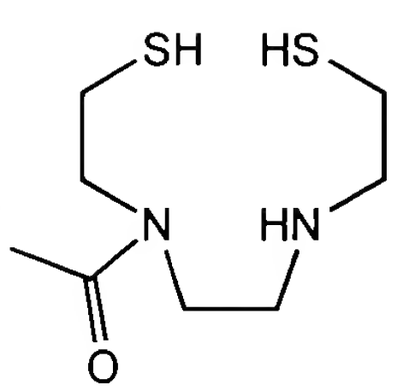
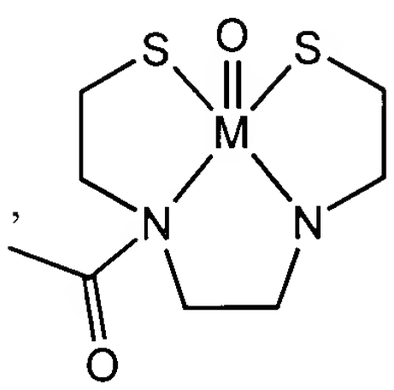
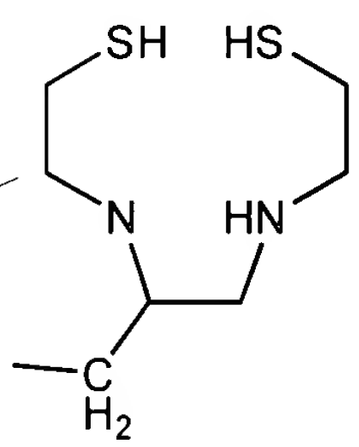
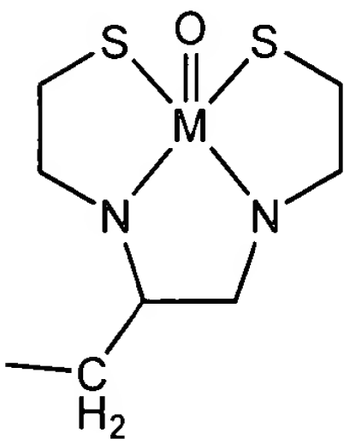
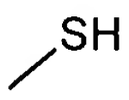
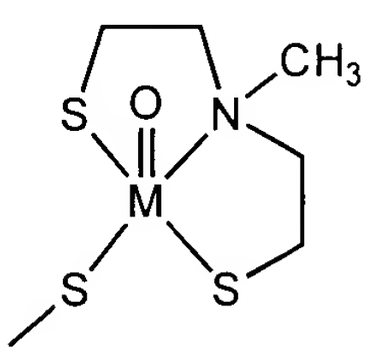
wherein R^8 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $NHCH_3$, NHC_2H_5, $N(C_2H_5)_2$, NHC_3H_7, $N(C_3H_7)_2$, NHC_4H_9, $N(C_4H_9)_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OH, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:

or


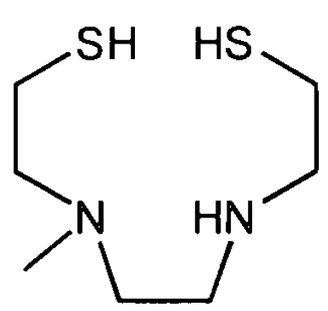
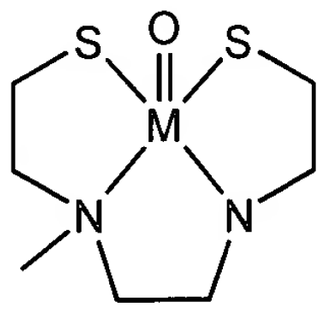
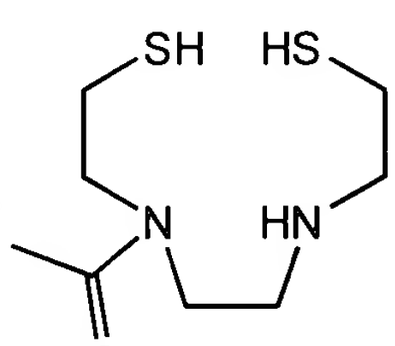
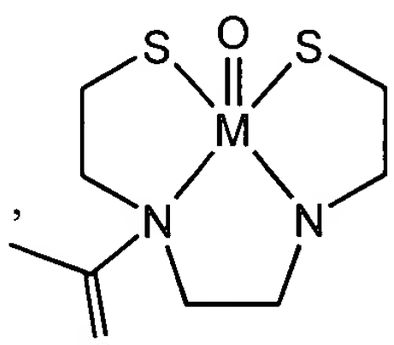
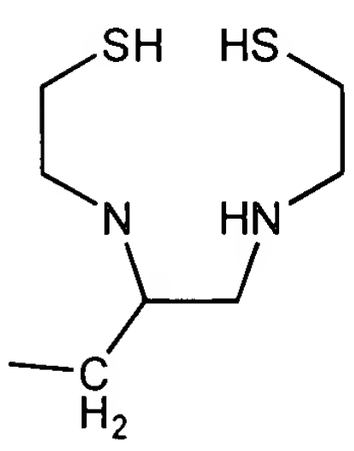
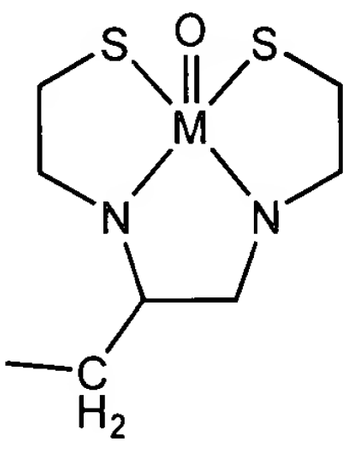
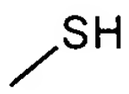
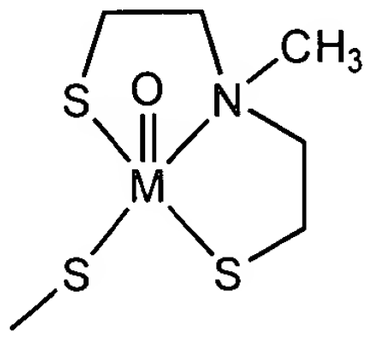
wherein M is selected from the group consisting of Tc and Re;

wherein R^9 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', NH_2, $NHCH_3$, NHC_2H_5, $N(C_2H_5)_2$, NHC_3H_7, $N(C_3H_7)_2$, NHC_4H_9, $N(C_4H_9)_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OH, OC_2H_5, OC_3H_7, OC_4H_9, SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:








or


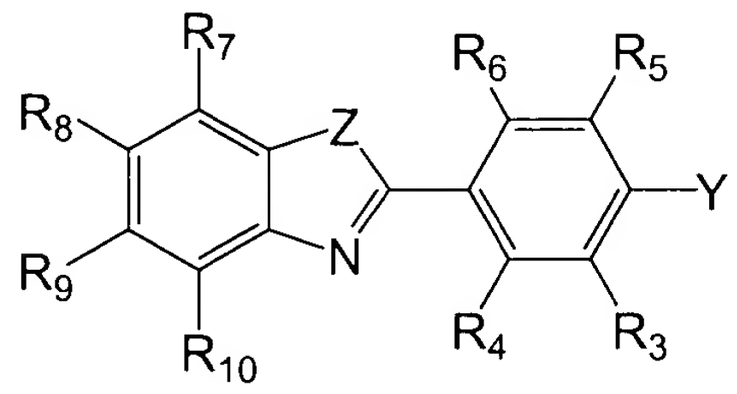
wherein M is selected from the group consisting of Tc and Re; and

wherein at least one of R^3-R^{10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:








or


wherein M is selected from the group consisting of Tc and Re.

86. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:

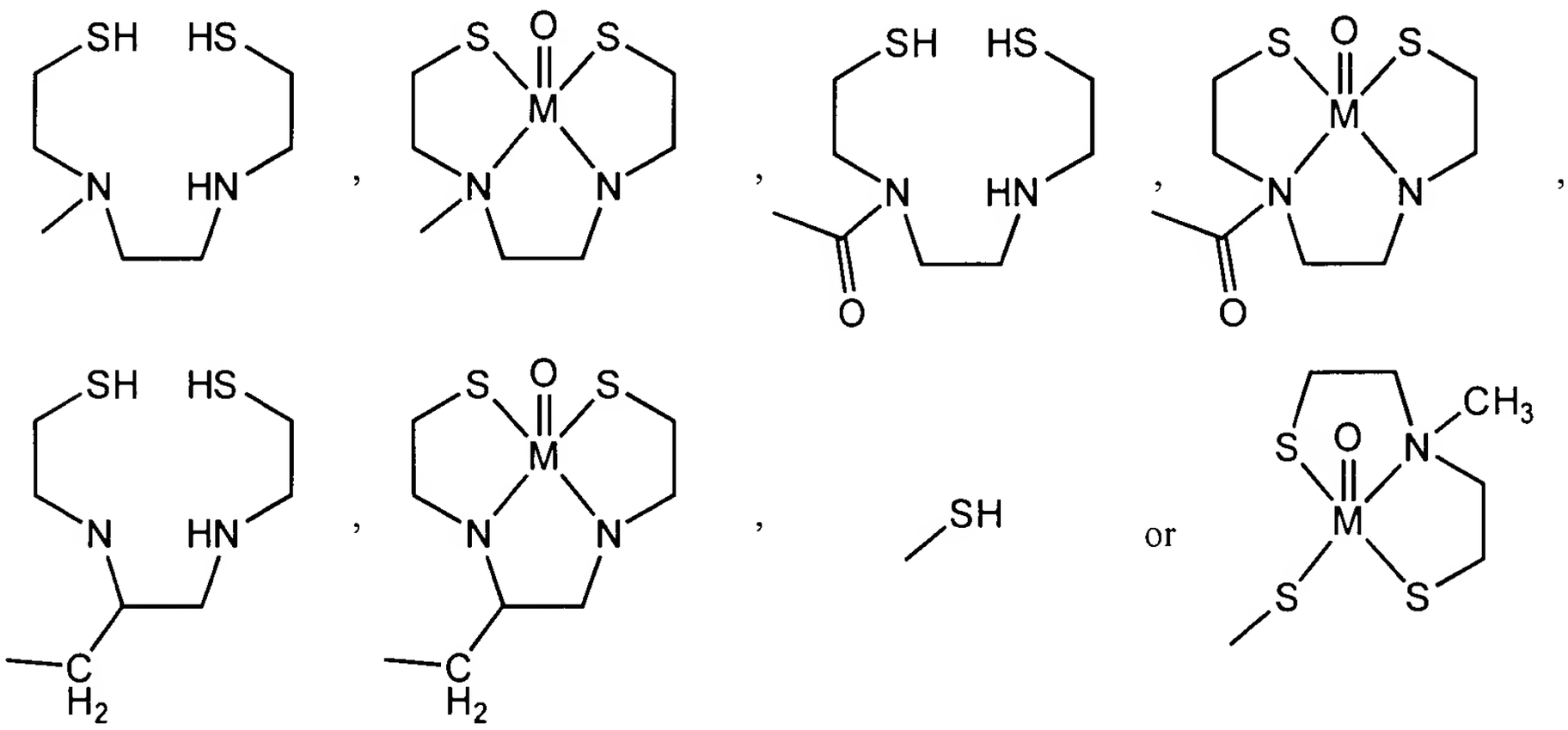


wherein Y is NR^1R^2; Z is S;

wherein R^1 and R^2 are both butyl or both CH_2R_{ph} (wherein R_{ph} represents an optionally substituted phenyl group); or

wherein R^1 is methyl and R^2 is selected from the group consisting of R_{ph}, CH_2R_{ph}, or (C=O)-R' (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group);

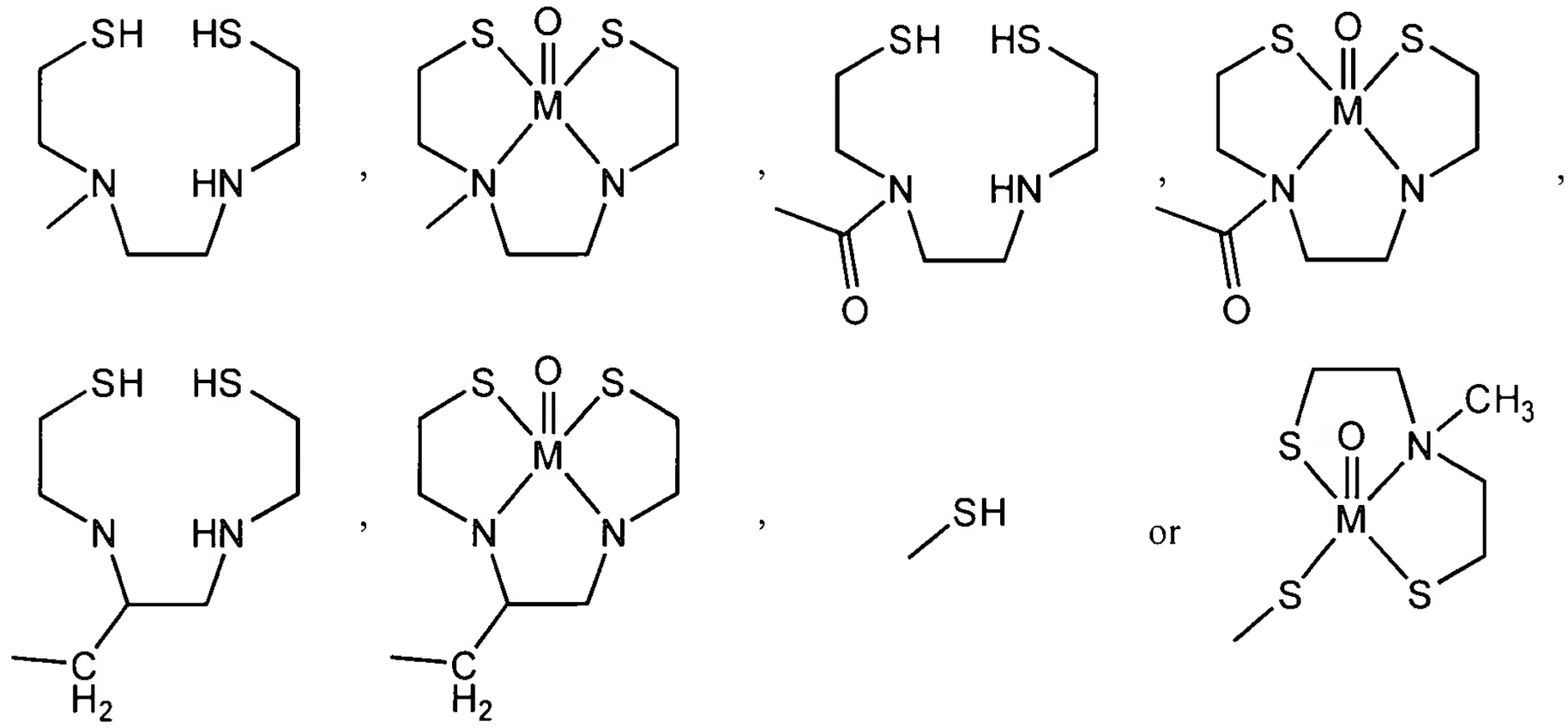
wherein each R^3- R^7 and R^9-R^{10} independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n=1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X=F, Cl, Br or I), CN, (C=O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR'=CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n=0,1,2,3,4, or 5; and L is:



or

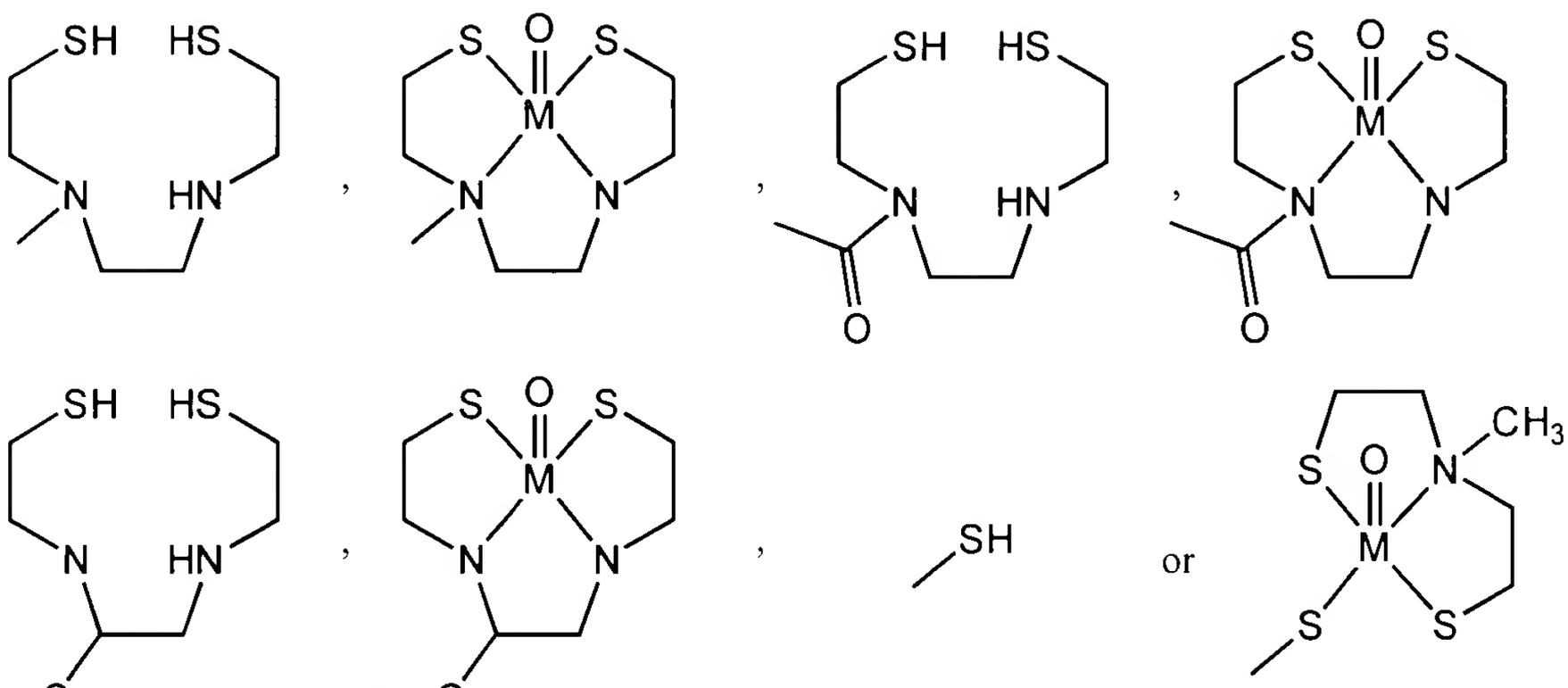
wherein M is selected from the group consisting of Tc and Re;

wherein R^8 is selected from the group consisting of H, F, Cl, Br, I, ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



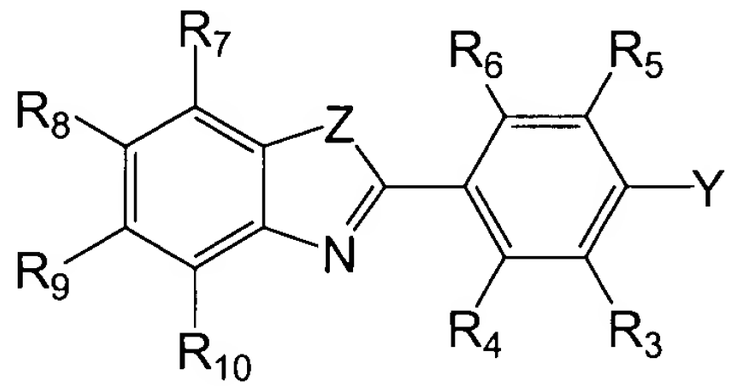
wherein M is selected from the group consisting of Tc and Re; and

wherein at least one of R^3-R^{10} is selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re.

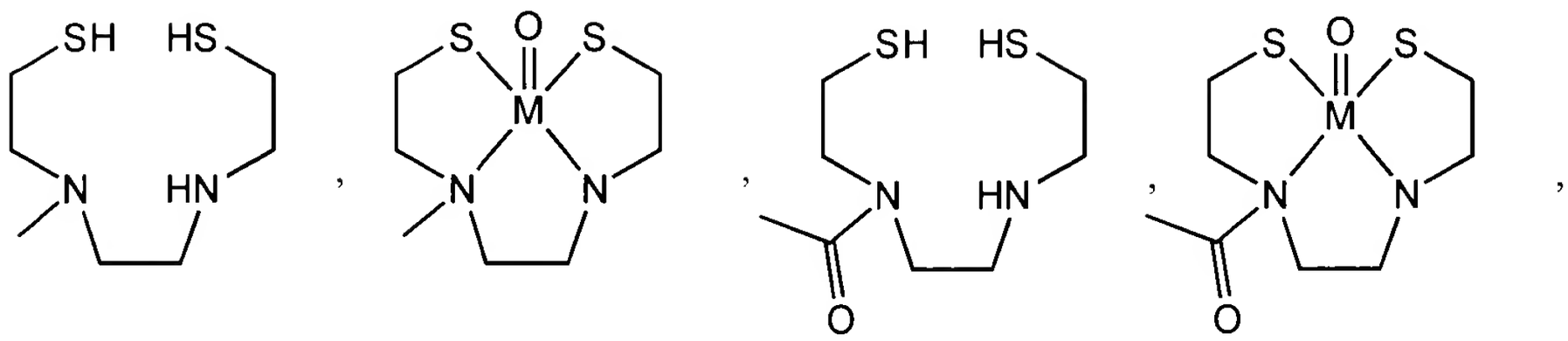
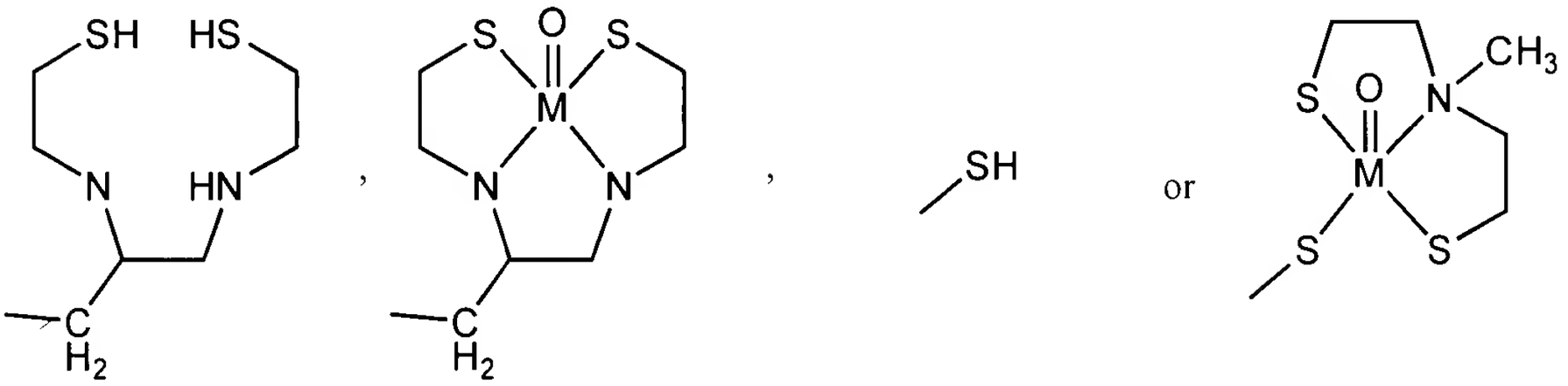
87. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Y is NR^1R^2; Z is S; R^1 is methyl;

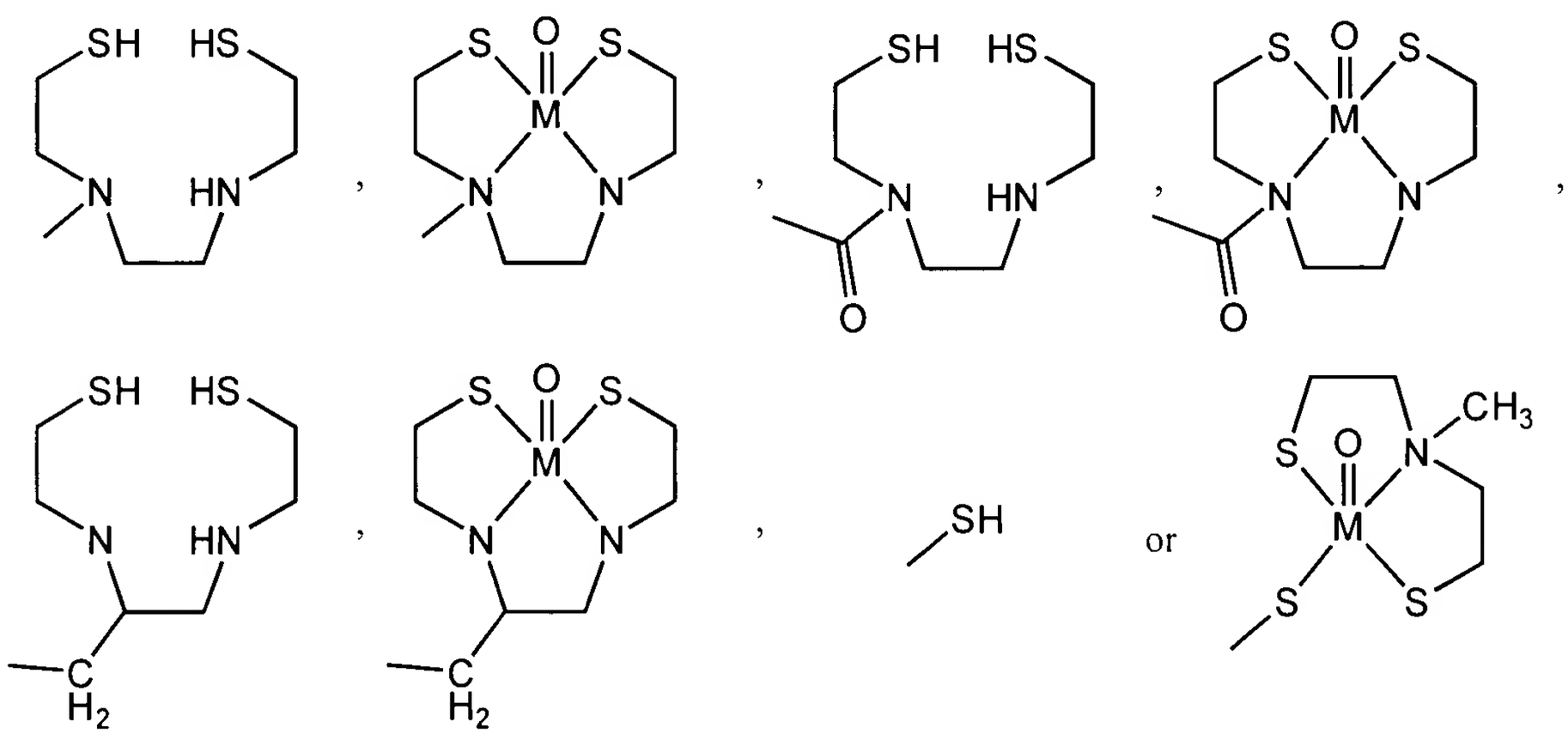
wherein R^2 is selected from the group consisting of a ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3 and R' is H or a lower alkyl group), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), and $(CH_2)_nR_{ph}$ (wherein n = 2, 3, or 4 and R_{ph} represents an optionally substituted phenyl group); or

wherein R^2 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is:

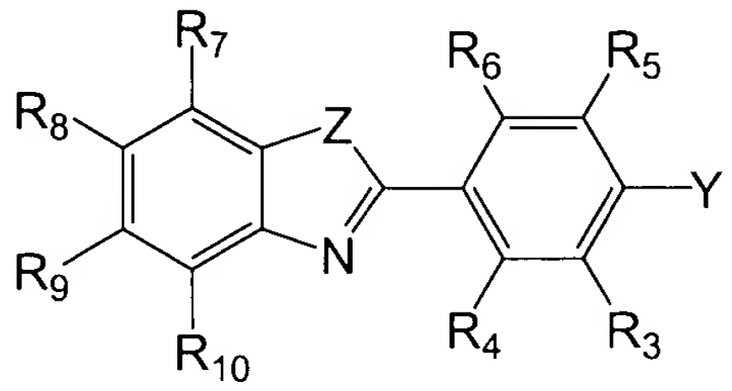
wherein M is selected from the group consisting of Tc and Re;

R^3 - R^{10} are independently selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re.

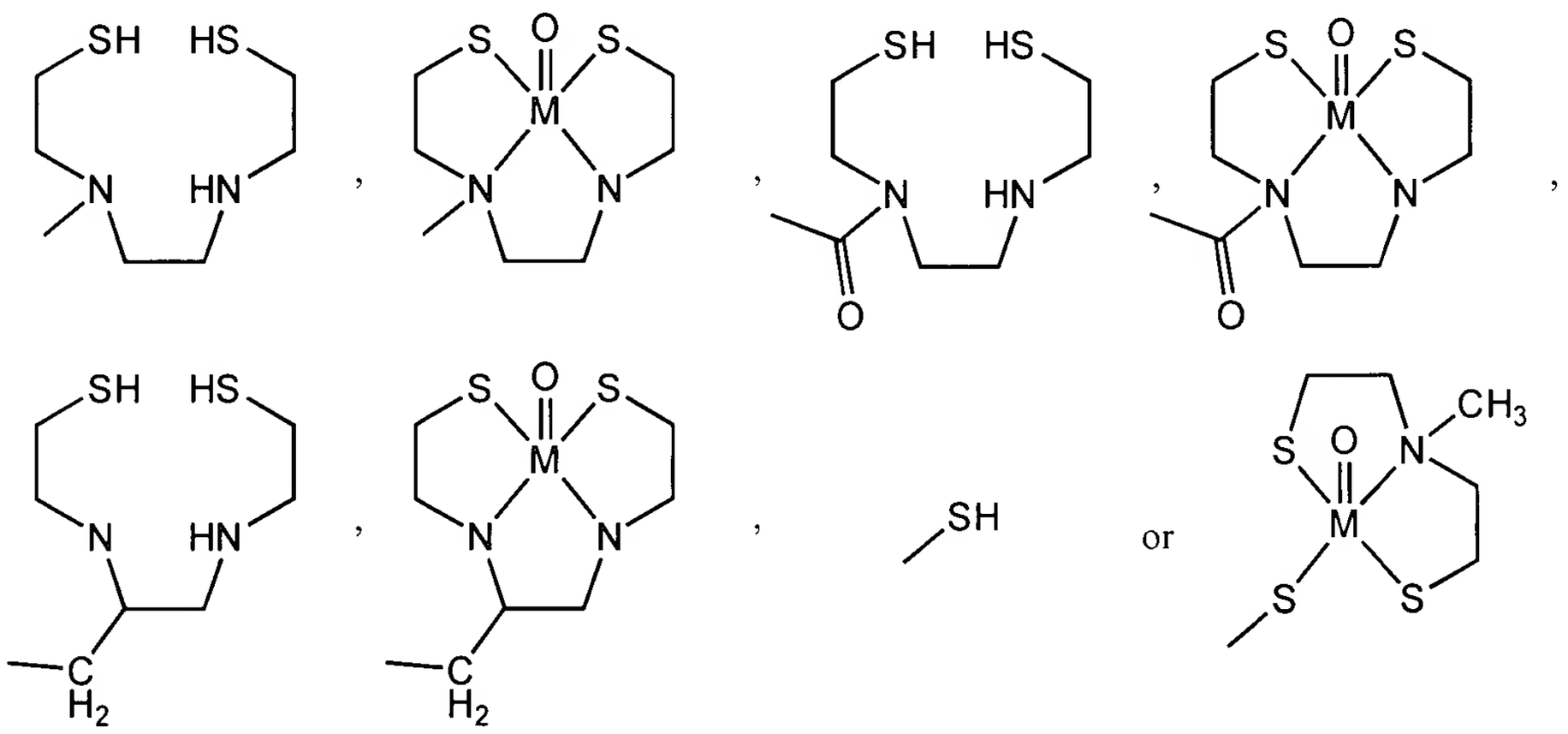
88. (New) An amyloid binding compound of the following formula or a water soluble, non-toxic salt thereof:



wherein Y is NR^1R^2; Z is S;

wherein R^1 is selected from the group consisting of a propyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3 and R' is H or a lower alkyl group), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R', R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 1, 2, 3, or 4 and R_{ph} represents an optionally substituted phenyl group); or

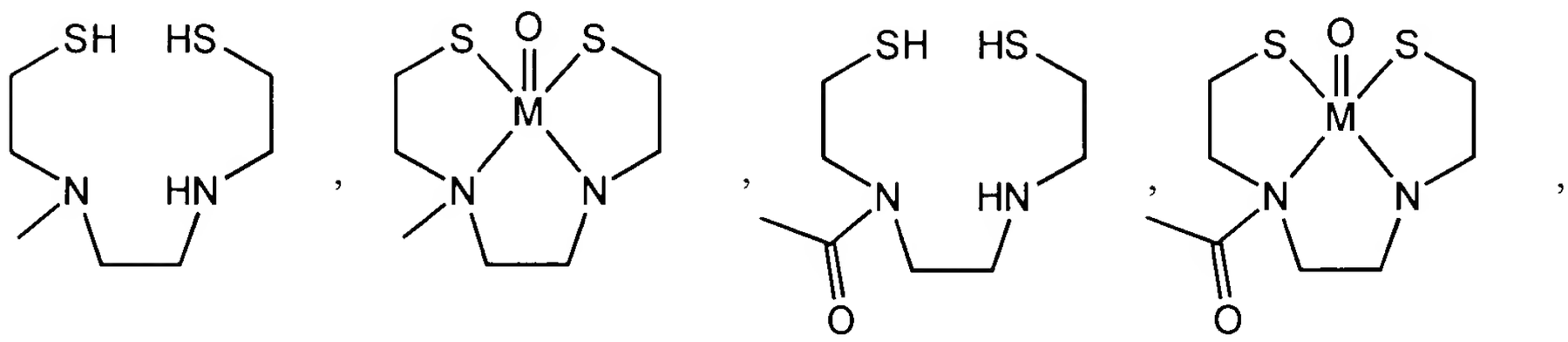
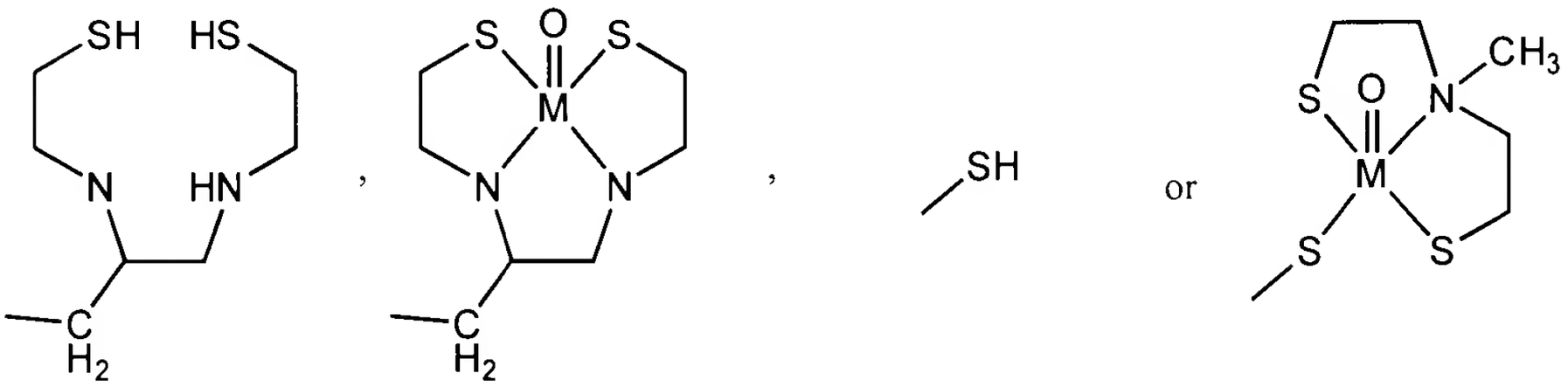
wherein R^1 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re;

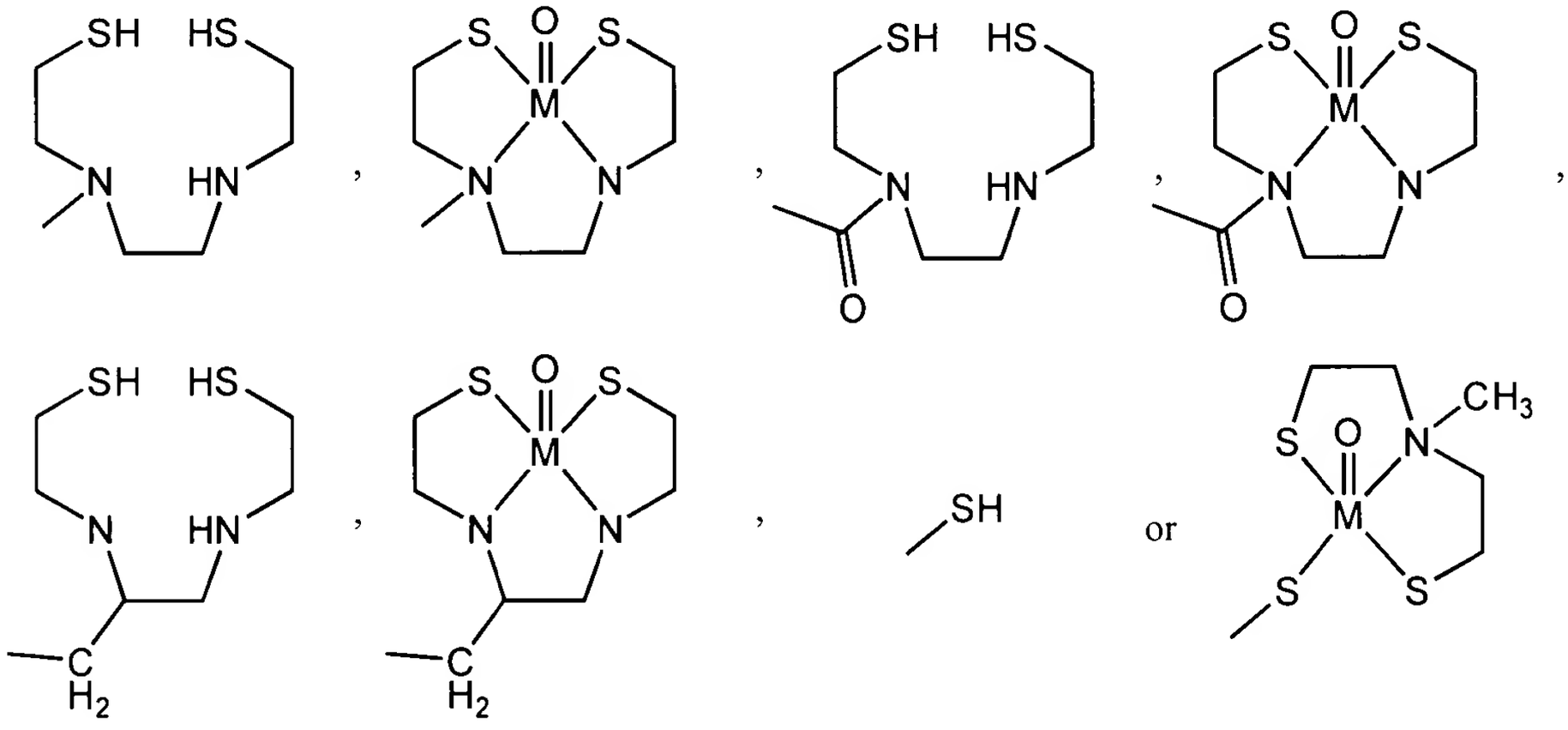
wherein R^2 is selected from the group consisting of a ethyl, propyl, butyl, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3 and R' is H or a lower alkyl group), CF_3, CH_2-CH_2X, CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), (C = O)-R', R_{ph}, and $(CH_2)_nR_{ph}$ (wherein n = 2, 3, or 4 and R_{ph} represents an optionally substituted phenyl group); or

wherein R^2 is a chelating group (with or without a chelated metal group) of the form W-L, wherein W is $-(CH_2)_n$ where n = 2,3,4, or 5; and L is:

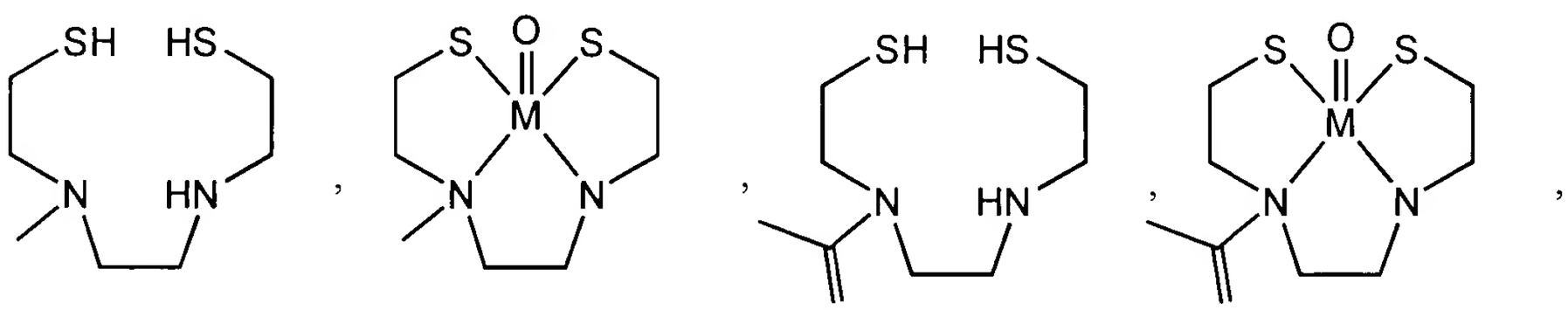
wherein M is selected from the group consisting of Tc and Re;

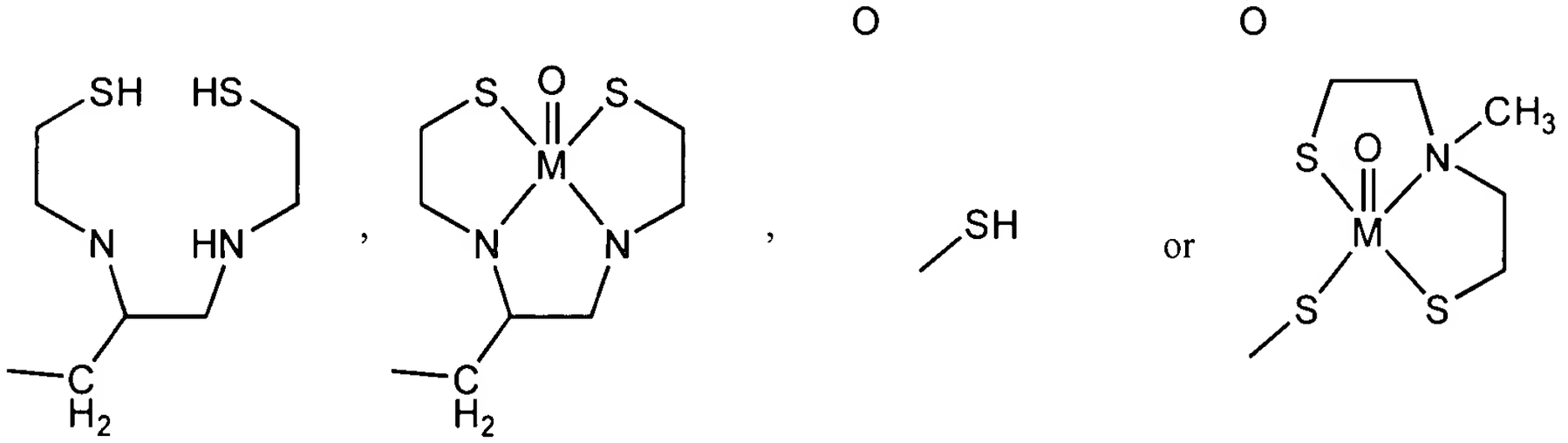
wherein each $R^3 - R^{10}$ independently is selected from the group consisting of H, F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR', R_{ph}, CR' = CR'-R_{ph}, CR_2'-CR_2'-R_{ph} (wherein R' is H or a lower alkyl group and R_{ph} represents an optionally substituted phenyl group) a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:



wherein M is selected from the group consisting of Tc and Re.

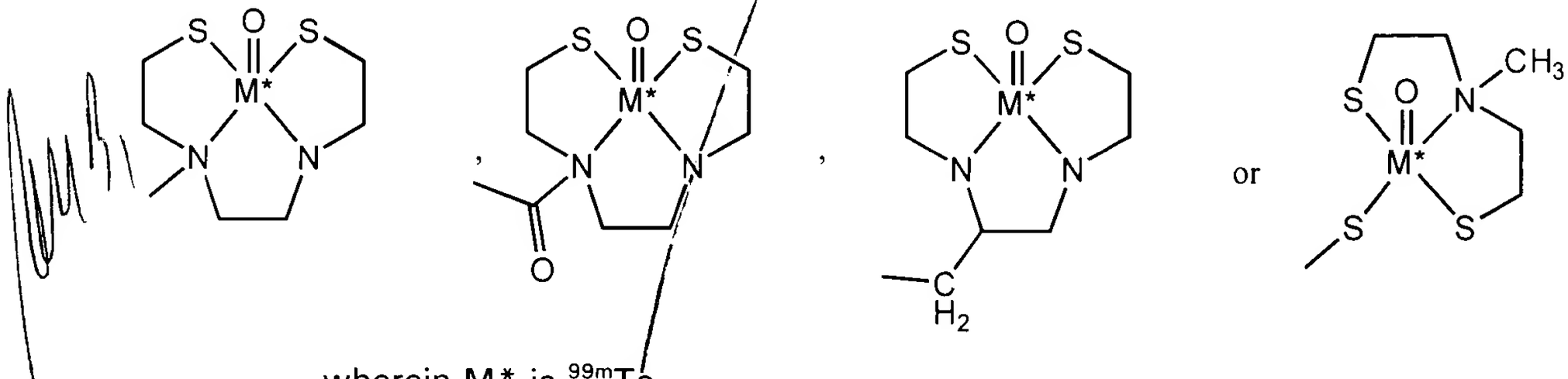
89. (New) The compound of any of claims 78-88 wherein the optional substituents of R_{ph} are selected from the group consisting of F, Cl, Br, I, a lower alkyl group, $(CH_2)_nOR'$ (wherein n = 1, 2, or 3), CF_3, CH_2-CH_2X, O-CH_2-CH_2X, CH_2-CH_2-CH_2X, O-CH_2-CH_2-CH_2X (wherein X = F, Cl, Br or I), CN, (C = O)-R', $N(R')_2$, NO_2, $(C=O)N(R')_2$, O(CO)R', OR', SR', COOR' (wherein R' is H or a lower alkyl group), a tri-alkyl tin and a chelating group (with or without a chelated metal group) of the form W-L or V-W-L, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L is:





wherein M is selected from the group consisting of Tc and Re.

90. (New) The compound of any of claims 78-88, wherein at least one of the substituents R^1-R^{10} is selected from the group consisting of ^{3}H, ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, CH_2-CH_2-X*, O-CH_2-CH_2-X*, CH_2-CH_2-CH_2-X*, O- CH_2-CH_2-CH_2-X* (wherein X* = ^{131}I, ^{123}I, ^{76}Br, ^{75}Br or ^{18}F), ^{19}F, ^{125}I, a carbon-containing substituent as specified in claim 78 or 79 wherein at least one carbon is ^{11}C, ^{13}C or ^{14}C and a chelating group (with chelated metal group) of the form W-L* or V-W-L*, wherein V is selected from the group consisting of –COO-, -CO-, -CH_2O- and -CH_2NH-; W is $-(CH_2)_n$ where n = 0,1,2,3,4, or 5; and L* is:



wherein M* is ^{99m}Tc.

91. (New) The compound of claim 84, wherein, $R^2 = CH_3$ and R^3- R^{10} are H.

92. (New) The compound of claim 78, wherein R^3 - $R^4 = H$, $R^5 = I$, and R^6- R^{10} are H.

93. (New) The compound of claim 82, wherein R^3 - $R^4 = H$, $R^5 = I$, and R^6- R^7 and R^9- R^{10} are H.

94. (New) The compound of claim 82, wherein R^3 - $R^6 = H$, $R^7 = I$, and R^9- R^{10} are H.

95. (New) The compound of claim 82, wherein R^3 - $R^7 = H$, $R^9 = I$, and $R^{10} = H$.

96. (New) The compound of claim 78, wherein R^2 - $R^4 = H$, $R^5 = I$, $R^8 = OH$ and R^6- R^7 and R^9- R^{10} are H.

97. (New) The compound of claim 79, wherein R^3 - $R^4 = H$, $R^5 = I$, $R^8 = OH$ and R^6- R^7 and R^9- R^{10} are H.

98. (New) The compound of claim 79, wherein R^3 - $R^6 = H$, $R^7 = I$, $R^8 = OH$ and R^9- R^{10} are H.

99. (New) The compound of claim 79, wherein R^3 - $R^7 = H$, $R^8 = OH$, $R^9 = I$, and $R^{10} = H$.

100. (New) The compound of claim 84, wherein, $R^2 = CH_2$-CH_2-CH_2-F and R^3- R^{10} are H.

101. (New) The compound of claim 80, wherein, $R^2 = CH_2$-CH_2-F and R^3- R^{10} are H.

102. (New) The compound of claim 81, wherein R^3 - $R^7 = H$, $R^8 = O$-CH_2-CH_2-F and R^9- R^{10} are H.

103. (New) The compound of claim 78, wherein R^3- $R^7 = H$, $R^8 = O$-CH_2-CH_2-F and R^9- R^{10} are H.

104. (New) The compound of claim 84, wherein $R^2 = CH_3$, R^3 - $R^7 = H$, $R^8 = O$-CH_2-CH_2-F and R^9- R^{10} are H.

105. (New) The compound of claim 79, wherein R^3 - $R^7 = H$, $R^8 = O$-CH_2-CH_2-F and R^9- R^{10} are H.

106. (New) The compound of claim 84, wherein $R^2 = CH_3$, R^3 - $R^7 = H$, $R^8 = OH$ and R^9- R^{10} are H.

107. (New) The compound of claim 79, wherein R^3 - R^7 = H, R^8 = OH and R^9- R^{10} are H.

108. (New) The compound of claim 84, wherein R^2 = CH_2-CH_2-CH_2-F, R^3 - R^7 = H, R^8 = OH and R^9- R^{10} are H.

109. (New) The compound of claim 87, wherein R^2 = CH_2-CH_2-CH_2-F, R^3 - R^7 = H, R^8 = OH and R^9- R^{10} are H.

110. (New) The compound of claim 80, wherein R^2 = CH_2-CH_2-F, R^3 - R^7 = H, R^8 = OH and R^9- R^{10} are H.

111. (New) The compound of claim 84, wherein R^2 = CH_3 and R^8 is selected from the group consisting of CN, CH_3, OH, OCH_3 and NH_2.

112. (New) The compound of claim 79, wherein R^8 is selected from the group consisting of CN, CH_3, OH, OCH_3 and NH_2.

113. (New) The compound of either of claims 111 or 112, wherein R^3- R^7 and R^9- R^{10} are H.

114. (New) The compound of claim any of claims 78-88, wherein the compound binds to Aβ with a dissociation constant (K_D) between 0.0001 and 10.0μM when measured by binding to synthetic Aβ peptide or Alzheimer's Disease brain tissue.

115. (New) A method for synthesizing a compound of any of claims 78-83 or 85-88 wherein at least one of the substituents R^1-R^{10} is selected from the group consisting of ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, and ^{19}F, comprising the step of labeling a compound of any of claims 78-83 or 85-88 wherein at least one of the substituents R^1-R^{10} is a tri-alkyl tin, by reaction of a compound of any of claims 44-49 or 51-54 with a ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, or ^{19}F containing substance.

116. (New) A method for synthesizing a compound of claim 84 having at least one of the substituents R^3- R^{10} selected from the group consisting of ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, and ^{19}F, comprising the step of labeling a compound of claim 84, wherein at least one of the substituents R^3 -R^{10} is a tri-alkyl tin, by reaction of the compound with a ^{131}I, ^{125}I, ^{123}I, ^{76}Br, ^{75}Br, ^{18}F, or ^{19}F containing substance.

117. (New) A pharmaceutical composition for *in vivo* imaging of amyloid deposits, comprising (a) a compound of any of claims 78-88 and (b) a pharmaceutically acceptable carrier.

118. (New) An *in vivo* method for detecting amyloid deposits in a subject, comprising the steps of:

(a) administering a detectable quantity of the pharmaceutical composition of claim 117, and

(b) detecting the binding of the compound to amyloid deposit in the subject.

119. The method of claim 118, wherein the amyloid deposit is located in the brain of a subject.

120. (New) The method of claim 118, wherein the subject is suspected of having a disease or syndrome selected from the group consisting of Alzheimer's Disease, familial Alzheimer's Disease, Down's Syndrome and homozygotes for the apolipoprotein E4 allele.

121. (New) The method of claim 118, wherein the detecting is selected from the group consisting of gamma imaging, magnetic resonance imaging and magnetic resonance spectroscopy.

122. (New) The method of claim 121, wherein the gamma imaging is either PET or SPECT.

123. (New) The method of claim 118, wherein the pharmaceutical composition is administered by intravenous injection.

124. (New) The method of claim 118, wherein the ratio of (i) binding of the compound to a brain area other than the cerebellum to (ii) binding of the compound to the cerebellum, in the subject, is compared to the ratio in normal subjects.

125. (New) A method of detecting amyloid deposits in biopsy or post-mortem human or animal tissue, comprising the steps of:

(a) incubating formalin-fixed or fresh-frozen tissue with a solution of an amyloid binding compound of claim 90 to form a labeled deposit and then,

(b) detecting the labeled deposits.

126. (New) The method of claim 125, wherein the solution is composed of 25-100% ethanol, with the remainder of the solution being water, wherein the solution is saturated with the amyloid binding compound.

127. (New) The method of claim 125, wherein the solution is composed of an aqueous buffer containing 0-50% ethanol, wherein the solution contains 0.0001 to 100 μM of the amyloid binding compound.

128. (New) The method of claim 125, wherein the detecting is effected by microscopic techniques selected from the group consisting of bright-field, fluorescence, laser-confocal, and cross-polarization microscopy.

129. (New) A method of quantifying the amount of amyloid in biopsy or post-mortem tissue, comprising the steps of:

(a) incubating a radiolabeled derivative of a compound of claim 90 with a homogenate of biopsy or post-mortem tissue, wherein at least one of the substituents R^1-R^{10} of the compound is labeled with a radiolabel selected from the group consisting of ^{125}I, ^{3}H, and a carbon-containing substituent as specified in claim 90, wherein at least one carbon is ^{14}C,

(b) separating the tissue-bound from the tissue-unbound radiolabeled derivative of a compound of claim 90,

c) quantifying the tissue-bound radiolabeled derivative of a compound of claim 90, and

d) converting the units of tissue-bound radiolabeled derivative of a compound of claim 90 to units of micrograms of amyloid per 100 mg of tissue by comparison with a standard.

130. (New) A method of distinguishing an Alzheimer's disease brain from a normal brain, comprising the steps of:

a) obtaining tissue from (i) the cerebellum and (ii) another area of the same brain other than the cerebellum, from normal subjects and from subjects suspected of having Alzheimer's disease;

b) incubating the tissues with a radiolabeled derivative of a compound of claim 90 derivative so that amyloid in the tissue binds with the radiolabeled derivative of a compound of claim 90;

c) quantifying the amount of amyloid bound to the radiolabeled derivative of a compound of claim 90, by administering a detectable quantity of the pharmaceutical composition comprising a compound of claim 90 with a pharmaceutically acceptable carrier, and detecting the binding of the compound to amyloid deposit in the subject;

d) calculating the ratio of the amount of amyloid in the area of the brain other than the cerebellum to the amount of amyloid in the cerebellum;

e) comparing the ratio for amount of amyloid in the tissue from normal subjects with the ratio for amount of amyloid in tissue from subjects suspected of having Alzheimer's disease; and

f) determining the presence of Alzheimer's disease if the ratio from the brain of a subject suspected of having Alzheimer's disease is above 90% of the ratios obtained from the brains of normal subjects.